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AUTHOR	Micek, Sidney S.; And Others
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ABSTRACT

This document defines a wide range of measures of the outcomes (results or impacts) of postsecondary education institutions and their programs and suggests procedures for acquiring the data needed for each measure. The outcome measures described are ones identified by a survey of institutional and state-level decision makers as providing the information most needed about the impacts of postsecondary education. The procedures presented are suggested methods for collection of data on each particular outcome measure, often with several alternatives suggested. The procedures are not all-inclusive, but rather are designed to suggest a starting point for institutions wishing to collect the data. Most procedures are relatively straight-forward, relying primarily on two methods of data collection: (1) a questionnaire administered to those receiving the benefits of postsecondary education or to those who can determine how many persons received certain benefits, and (2) searches of institutional records. The manual has been designed so that each outcome measure and its associated data collection procedures are presented separately. (Author/JMF)

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OUTCOME MEASURES AND PROCEDURES MANUAL

FIELD REVIEW EDITION

Technical Report No. 70

Sidney S. Micek
Allan L. Service
Yong S. Lee

May 1975

National Center for Higher Education Management Systems
at Western Interstate Commission for Higher Education

P.O. Drawer P Boulder, Colorado 80302

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Executive Director, WICHE:

Robert H. Kroepsch

Associate Director, WICHE, and
Director, National Center for
Higher Education Management Systems
at WICHE:

Ben Lawrence

Deputy Director, NCHEMS:

Robert A. Wallhau[illegible]

Assistant Director NCHEMS,
Communication Base Programs,

Dennis Jones

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To design, develop, and encourage the implementation of management information systems and data bases including common data elements in institutions and agencies of higher education that will:

- provide improved information to higher education administration at all levels.
- facilitate exchange of comparable data among institutions.
- facilitate reporting of comparable information at the state and national levels.

Western Interstate Commission for Higher Education
Post Office Drawer P — Boulder, Colorado 80302

ABSTRACT

The Outcome Measures and Procedures Manual defines a wide range of measures of the outcomes (results or impacts) of postsecondary education institutions and their programs and suggests procedures for acquiring the data needed for each measure.

The outcome measures described in the manual are ones identified by a survey of institutional and state-level decision makers as providing the information most needed about the impacts of postsecondary education. The survey itself is described in another NCHEMS document, The Higher Education Outcome Measures Identification Study (Micek and Arney, 1974).

The procedures presented in the manual are suggested methods for collection of data on each particular outcome measure, often with several alternatives suggested. The procedures are not all-inclusive, but rather are designed to suggest a starting point for institutions wishing to collect the data. Most procedures are relatively straight-forward, relying primarily on two methods of data collection: (1) a questionnaire administered to those receiving the benefits of postsecondary education or to those who can determine how many persons received certain benefits, and (2) searches of institutional records.

The manual has been designed so that each outcome measure and its associated data collection procedures are presented separately. As a result, the manual is intended to serve as a flexible and adaptable aid that allows individual users to choose those outcome measures and related data collection procedures most relevant to their outcome information needs.

PREFACE

Decision makers in postsecondary education today are increasingly expressing the need for better information about the outcomes (results and impacts) of their institutions and programs. A multiplicity of pressures have accounted for this increased need. For example, a shrinking financial support base is compelling many institutions to reassess their missions and goals and to initiate more effective and efficient use of scarce resources. Further, shifting demands in the type and quality of educational goods and services are forcing institutions to examine how well they are meeting the changing demand structure. While information about institutional and program outcomes is not a cure-all for problems such as these, it can help institutions determine where they stand, assess how well they are performing, examine what impacts they are having, and identify directions they should pursue in the future.

While postsecondary education decision makers have this important need for better outcome information, little progress has been made to date in helping them obtain and understand such information. For the most part, the difficulty rests with the complexities of identifying, measuring, and analyzing postsecondary education outcomes.

The Outcome Measures and Procedures Manual has been developed to help decision makers deal with these problems. The manual has been designed to serve as a flexible and practical guide for acquiring the data necessary to obtain a wide range of outcome information. It does this by presenting an array of alternative procedures that can be used by institutional researchers and planners to obtain local data for a select number of postsecondary education outcome measures (indicators).

The outcome measures and their associated data acquisition procedures contained in this field review edition of the manual have been developed in two phases. Phase I concerned the identification of those outcome measures most needed by postsecondary education decision makers. Recognizing that the NCHEMS constituency is composed primarily of institutional and state-level decision makers, the following types of decision makers were surveyed to determine the outcome measures they believed would help provide the outcome information they need for carrying out their job responsibilities:

1. Administrators from community colleges, public and private four year colleges, and public and private universities. The particular administrators surveyed in these institutions were the president and top-level administrators for academic planning, student affairs, and budget and finance.
2. State directors of higher education and community/junior college governing boards and coordinating councils.
3. State legislators who chair legislative committees concerned with education and appropriations.

Mailed questionnaires were used in the survey to solicit responses from the different decision makers in the sample. The list of outcome measures included in the survey questionnaires was taken from NCHEMS Inventory of Higher Education Outcome Variables and Measures (Micek and Wallhaus, 1973).

Phase II was designed to develop operational definitions and data acquisition procedures for the top-priority outcome measures identified in Phase I. Major activities in the second phase included synthesizing procedures being used by institutions or individual researchers to acquire various types of outcome information and conducting special workshops to supplement staff efforts in the development of improved and new outcome measures and data acquisition procedures.

This field review edition of the manual, which concludes the work of Phase II, is being published to solicit potential user's comments and suggestions about its organization, content, and overall utility. The review of the manual also will include intensive pilot tests at selected institutions to assess the feasibility and usefulness of the outcome measures and data acquisition procedures contained herein. The results of this review process will be used to improve upon the manual, which will be published as a "first edition" document in 1976.

With the purpose of the review of the manual in mind, you are invited and encouraged to provide comments and suggestions for improving the manual. Also, NCHEMS would appreciate receiving copies of: (1) any materials you develop, such as questionnaires, that incorporate versions of the measures and data acquisition procedures presented in the manual, and (2) the results of studies you undertake for which the manual has been used.

ACKNOWLEDGEMENTS

Many people deserve special mention for their assistance in the development of this field review edition of the Outcome Measures and Procedures Manual. First and foremost, we would like to acknowledge the members of NCHEMS Outcomes of Postsecondary Education Project's Task Force for their excellent contributions and critical reviews. Members of the Task Force are:

Dr. George M. Barton
Practicum Director
National Ed.D. Program for Community College Administrators and Teachers
Nova University

Dr. Lattie F. Coor
Vice-Chancellor
Assistant Professor of Political Science
Washington University

Mr. David W. Davis
Budget Consultant to the Financial Vice-President
Harvard University

Dr. G. Bruce Dearing
Vice-Chancellor for Academic Programs
State University of New York

Dr. W. Keith Evans, Director
Office of Planning and Institutional Research
Portland State University

Dr. Richard L. Fox
Associate Secretary
Director of Research and Management Information Systems
Illinois Jr. College Board

Dr. Charles Graham
President
St. Cloud State College

Dr. Theodore Volsky, Jr.
Vice-Provost
Professor of Psychology
University of Colorado

Ex Officio members of the Task Force are:

Dr. Alexander Astin, Director
Cooperative Institutional Research Program
University of California, Los Angeles

Mr. Henry G. Kirschenmann, Jr.
Director, Division of Cost Policy and Negotiation
Office of Grant Administration Policy
Department of Health, Education and Welfare

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SECTION I

OVERVIEW OF THE MANUAL

Introduction

Most decision makers concerned with postsecondary education recognize the need for information about the outcomes (results and impacts) of institutions and their programs for purposes of planning, management, and evaluation, and also for supporting and justifying long-range plans and budgets. These same decision makers are quick to point out, however, the complexities of identifying, measuring, and analyzing postsecondary education outcomes and of incorporating this information into the planning, management, and evaluation process. Although these complexities will continue to plague efforts to obtain and use outcome information, the Outcome Measures and Procedures Manual is intended as a step forward in dealing with them. The manual does this by presenting an array of alternative procedures for obtaining a variety of potential measures or indicators of the outcomes of postsecondary institutions and their programs. The manual provides:

1. A list of postsecondary education outcome measures or indicators that have been identified as highly relevant to the outcome information needs of institutions and state-level educational decision makers.
2. Standard definitions of each outcome measure to facilitate communication among decision makers.
3. Specific procedures that can be used for acquiring data related to each outcome measure presented in the manual.

Five major criteria were used in selecting the outcome measures for inclusion in the manual and in developing the procedures for obtaining those measures:

1. The manual should, to the extent possible, bridge the full range of postsecondary education outcome measures. Measures of the outcomes of the instruction, research, community service, and institutional support programs associated with various types of postsecondary institutions should be considered for inclusion in the manual.
2. The outcome measures entertained for inclusion in the manual should reflect the fact that postsecondary education outcomes occur over an extended time period. Therefore, the manual should consider measures of both short-term and long-term outcomes.
3. The outcome measures and their corresponding data acquisition procedures should reflect a recognition that the information needed by different decision makers varies considerably as to when it is needed and at what level of detail.
4. The initial version of the manual should be primarily a compilation of the current state-of-the-art capability with respect to feasibility of outcome data collection. Future versions will incorporate improved and newly developed outcome data acquisition procedures.
5. The manual should be a flexible and adaptable tool from which users can pick and choose the procedures most appropriate for acquiring data related to the outcome measures they need.

While the manual is intended to serve as a practical and flexible tool that can be used by many different audiences, it has been designed especially for use by persons responsible for educational planning, institutional research, and program evaluation activities in postsecondary institutions and agencies. Also, it has been designed to be used not only by single institutions and agencies but also by institutions and agencies that are involved in cooperative data collection and exchange efforts, such as institutional consortia.

A Context for Using the Manual

The Outcome Measures and Procedures Manual is just one of a series of products being developed as part of the Outcomes of Postsecondary Education project at the National Center for Higher Education Management Systems.

Two other products that have been developed and relate to the manual include The Inventory of Higher Education Outcome Variables and Measures contained in NCHEMS Technical Report 40 (Micek and Wallhaus, 1973) and The Higher Education Outcome Measures Identification Study instrument and procedures (Micek and Arney, 1974). The Outcomes Inventory, which is presented in Appendix A, potentially has a number of uses, including the translation of broad institutional and program goals into measurable objectives and the setting of alternative program priorities. The Outcome Measures Identification Study (OMIS) instrument and procedures were developed initially to help identify the measures for inclusion in this manual. However, they have been found to be useful to institutions in helping to determine the outcome information needs of a wide variety of individuals and groups.

While each of the products developed thus far in the Outcomes project can be used independently, they have been designed to support an "outcome-oriented" approach to educational planning, management, and evaluation. This approach emphasizes an explicit understanding of the outcomes of an institution or program at each stage in the planning, management, and evaluation cycle. Because an understanding of the "outcome-oriented" planning, management, and evaluation cycle is important for capitalizing fully upon the potential value of the manual, a description of the major components of that cycle and the use of the manual therein follows. It should be noted, however, that this description is conceptual and not operational.

As indicated in Figure 1, the first step in the outcome-oriented planning, management, and evaluation cycle concerns the selection of the planning focus, that is, designating the institution or program unit toward which planning, management, and evaluation efforts will be directed. Although this may appear to be an obvious prerequisite, inappropriate planning and data collection activities ofter are undertaken simply because the institutional or program unit that will be the "unit of focus" has not been adequately defined in advance. For example, assessment of the outcomes of particular degree programs is impossible unless data are collected in such a way as to permit their disaggregation below the level of the total institution.

One convenient guide for helping in the selection of the unit of focus is the NCHEMS Program Classification Structure (PCS), which is shown in Figure 2. The PCS defines a hierarchy of organizational and program units ranging from the total institution down to individual program elements such as

Figure 1

OUTCOME-ORIENTED PLANNING, MANAGEMENT, AND EVALUATION CYCLE

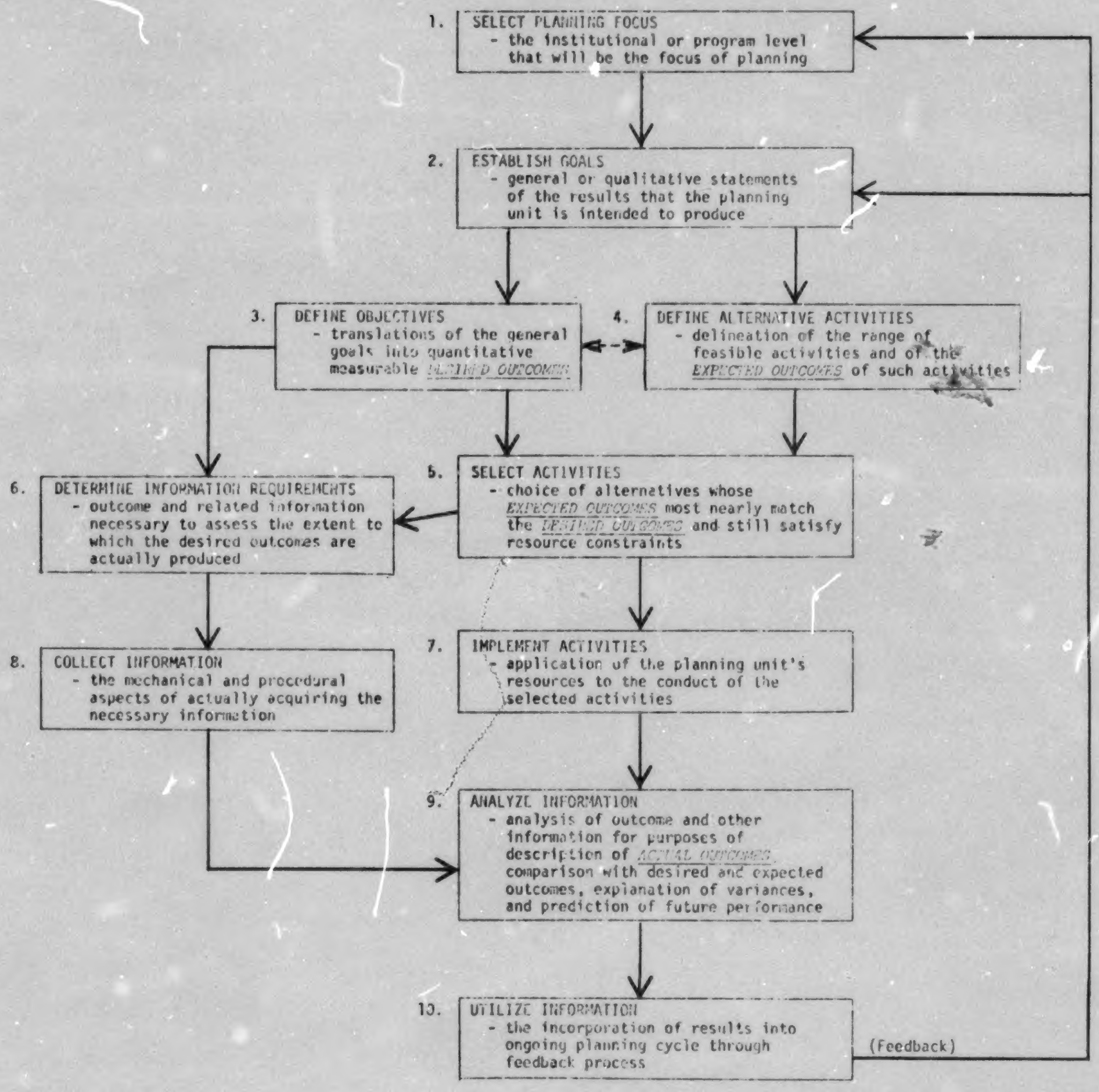
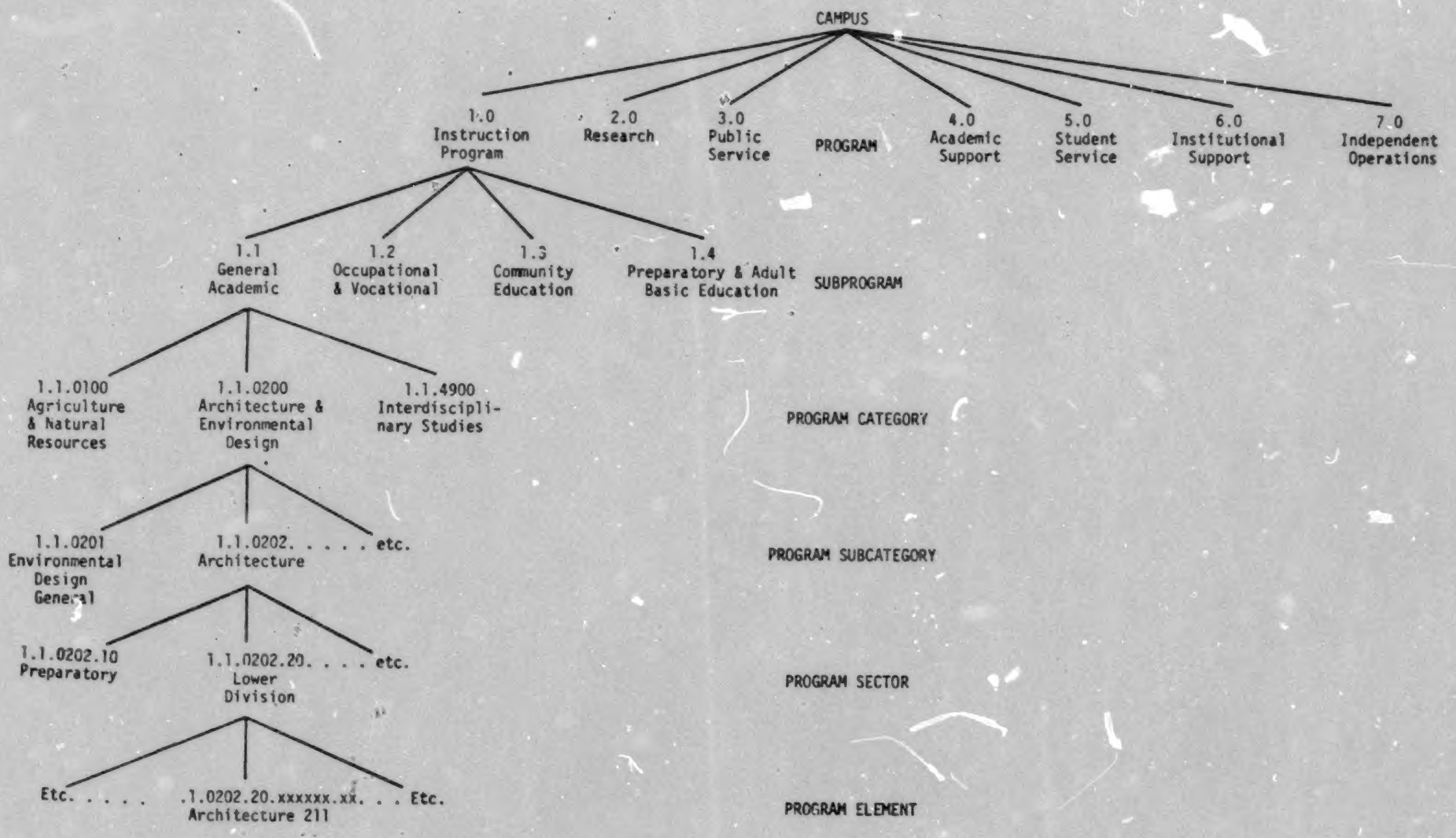

1. SELECT PLANNING FOCUS - the institutional or program level that will be the focus of planning
2. ESTABLISH GOALS - general or qualitative statements of the results that the planning unit is intended to produce
3. DEFINE OBJECTIVES - translations of the general goals into quantitative measurable DESIRED OUTCOMES
4. DEFINE ALTERNATIVE ACTIVITIES - delineation of the range of feasible activities and of the EXPECTED OUTCOMES of such activities
5. SELECT ACTIVITIES - choice of alternatives whose EXPECTED OUTCOMES most nearly match the DESIRED OUTCOMES and still satisfy resource constraints
6. DETERMINE INFORMATION REQUIREMENTS - outcome and related information necessary to assess the extent to which the desired outcomes are actually produced
7. IMPLEMENT ACTIVITIES - application of the planning unit's resources to the conduct of the selected activities
8. COLLECT INFORMATION - the mechanical and procedural aspects of actually acquiring the necessary information
9. ANALYZE INFORMATION - analysis of outcome and other information for purposes of description of ACTUAL OUTCOMES, comparison with desired and expected outcomes, explanation of variances, and prediction of future performance
10. UTILIZE INFORMATION - the incorporation of results into ongoing planning cycle through feedback process
(Feedback)

Figure 2

PROGRAM CLASSIFICATION STRUCTURE


CAMPUS
1.0 Instruction Program
2.0 Research
3.0 Public Service
PROGRAM
4.0 Academic Support
5.0 Student Service
6.0 Institutional Support
7.0 Independent Operations
1.1 General Academic
1.2 Occupational & Vocational
1.3 Community Education
1.4 Preparatory & Adult Basic Education
SUBPROGRAM
1.1.0100 Agriculture & Natural Resources
1.1.0200 Architecture & Environmental Design
1.1.4900 Interdisciplinary Studies
PROGRAM CATEGORY
1.1.0201 Environmental Design General
1.1.0202. . . . . etc.
Architecture
PROGRAM SUBCATEGORY
1.1.0202.10 Preparatory
1.1.0202.20. . . . etc.
Lower Division
PROGRAM SECTOR
Etc. . . . .
.1.0202.20.xxxxxx.xx. . . Etc.
Architecture 211
PROGRAM ELEMENT

---

*This represents the latest version of the PCS (See Collier, 1975).

courses. It should be noted, however, that the data collection procedures contained in this manual do not lend themselves to the measurement and analysis of outcomes at the individual course or program element level of the PCS.

Once the unit of focus is determined, the goals of the unit must be established (Step 2). Such goals ideally are based on the unit's overall mission and on assessment of constituents' needs. They also are typically rather broad statements of the desired results and impacts that are to be accomplished by the institution or program in focus. The Inventory of Higher Education Outcome Variables and Measures (Micek and Wallhaus, 1973) can play a useful role at this point (see Appendix A). The outcome variables listed in the Inventory are helpful in defining the range of possible goals that might be adopted. Among other instruments that also may be relevant is the Institutional Goals Inventory (Peterson, 1971) developed by the Educational Testing Service. The IGI instrument has been designed to solicit opinions about "what are" the goals of an institution and "what should be" the goals.

The next step in the outcome-oriented planning, management, and evaluation cycle (Step 3) concerns translating the broadly stated goals of the unit in focus into operationally stated objectives, that is, objectives stated in terms of specific, measurable, desired outcomes. The Inventory of Higher Education Outcome Variables and Measures can also be most useful in this step of the cycle since it identifies a variety of specific outcome measures that potentially reflect a wide range of outcome-oriented goals (or in the terms of the Inventory--outcome variables). Appendix A, in addition to presenting the Inventory, presents a set of guidelines that describe how the lists of potential outcome variables and measures in the Inventory can be used to translate broadly stated goals into specific measurable objectives.

In Step 4, which parallels Step 3, the range of alternative courses of action (alternative activities) that the unit in focus might undertake to achieve the desired outcomes is delineated. Included in the identification of the feasible alternatives is the definition of a set of expected outcomes associated with each alternative being considered.

The distinction made in the outcome-oriented planning, management, and evaluation cycle between desired outcomes and expected outcomes is an important one. It is intended to make planners focus on what outcomes can realistically be expected from a particular alternative. Too often, planners identify the outcomes that are desired but never adjust their expectations after selecting a given alternative, which may be designed to produce only part of the desired outcomes because of such factors as resource and environmental constraints.

Once the expected outcomes of each alternative under consideration and the desired outcomes identified in the objective-setting step are determined, they become input to the activity selection step (Step 5) of the cycle. In the activity selection step, the set of desired outcomes and the set of expected outcomes associated with each alternative are compared to one another so that a decision can be made about which alternative will produce the results and impacts that most closely match the desired outcomes. In practice, however, the activity selection decision also must take into account resources and other constraints. Therefore, the expected outcomes of an alternative are likely to be somewhat less ambitious than the desired outcomes.

Once the decision has been made concerning the alternative to be implemented, it becomes possible to determine specific outcome and related data (resource, process, and environmental data) requirements that will be necessary to assess the extent to which the expected outcomes of the selected alternative are accomplished (Step 6). Resource, process, and environmental data are necessary because outcome data considered in isolation from these mitigating factors may have very little meaning or utility for planning, management, and evaluation purposes.*

Step 7 in the cycle represents the actual implementation of the selected alternative. At the same time, the process of collecting the outcomes and related data should be undertaken (Step 8). It is at this point that the Outcome Measures and Procedures Manual (OMPM) plays a paramount role since it provides procedures for acquiring the outcome data that are reflective of the expected outcomes. Procedures for using the OMPM to accomplish this task will be described in more detail later in this section.

After the outcome and related data have been collected, they can be analyzed for purposes of assessing and understanding the actual outcomes that result from the alternative that was implemented (Step 9). Interest here may center on simple descriptions of the outcomes that result or may concern an explanation of why certain outcomes occurred or didn't occur. Another objective may be the comparison of the actual outcomes with both the desired and the expected outcomes identified earlier. Analysis also may be directed toward prediction of future institutional or program performance.

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*NCHEMS Technical Report 35, Program Measures (Topping and Miyataki, 1973), can be very helpful in identifying the other kinds of data that might be appropriate for interpreting the outcome data that will be collected.

Finally, the information that results from the analysis should be used as feedback for future planning activities (Step 10). This aspect of the outcome-oriented planning, management, and evaluation cycle is extremely important. Unless the results of each cycle are incorporated into the next cycle, the entire process runs the risk of degenerating into an interesting, but not particularly useful, exercise.

As previously mentioned, the description of the outcome-oriented planning, management, and evaluation cycle presented above is conceptual and not operational. Furthermore, viewing the cycle as a strictly sequential process will be deceiving. In practice, it is often encessary to retrace and redo certain steps on the basis of experience later in the cycle. Thus, for example, the objective-setting step (Step 3) may cause some rethinking of the general goals identified in Step 2. Similarly, an attempt to use outcome information as feedback may reveal new needs for analysis or even entirely new pieces of information.

In trying to implement the outcome-oriented planning, management, and evaluation cycle, there should be no illusion that it is an easy task. For one thing, the specific desired outcomes of an institution or program are difficult to identify and agree upon because the goals and values of individuals, programs, and institutions differ. Furthermore, even when desired outcomes or objectives are identified and consensus is reached, few explicit criterion measures or indicators of actual institutional and program outcomes are available. Finally, in cases where planners and decision makers have information about an institution's or program's outcomes, they have much difficulty interpreting the information, since procedures for analyzing and using the information often are not adequate or are not understood. Such difficulty can be attributed to a host of factors: the complexity of postsecondary education systems, multiple and joint products and impacts, unintended side effects, paucity of adequate statistical techniques for effective data analysis, and lack of sufficient data bases for interprogram and interinstitutional comparison. It is hoped, however, that the Outcome Measures and Procedures Manual will be a useful tool in beginning to deal with these difficulties.

Content of the Manual

This field review edition of the Outcome Measures and Procedures Manual presents definitions and data acquisition procedures for a group of postsecondary education outcome measures that have been identified as high priority in terms of the outcome information needs of institutional planners and managers and state-level decision makers. These priorities are based on the inputs of the NCHEMS Outcomes of Postsecondary Education Project task force and the results of the Higher Education Outcome Measures Identification Study (Micek and Arney, 1974). The Outcome Measures Identification Study was designed to have institutional administrators (presidents and top-level administrators for academic planning, student affairs, and budget and finance) and state-level decision makers (state directors of higher education agencies and state legislators) identify those outcome measures that are of high importance for helping provide the outcome information they need for carrying out their various decision-making responsibilities.

The outcome measures and their associated data acquisition procedures presented in this manual have been organized into the three major sections that follow this overview section:

Section II: Student Growth and Development Measures and Procedures

Section III: New Knowledge and Art Forms Measures and Procedures

Section IV: Community Development and Service Measures and Procedures

While these three sections correspond to the major sections of the NCHEMS Inventory of Higher Education Outcome Variables and Measures presented in Appendix A, the categories within each section do not match up exactly with those in the Outcomes Inventory. (Figure 3 on the next page presents the structure used to organize the outcome measures and data acquisition procedures contained in the manual.)

For each outcome measure contained in Sections II, III, and IV, a one-page abstract is presented that provides:

1. The name of the outcome measure.
2. The number used to categorize the measure.
3. A definition of the measure.

Figure 3

OUTCOME MEASURES AND PROCEDURES CATEGORIES

STUDENT GROWTH AND DEVELOPMENT

A. Student Knowledge and Skills Development
- Measures and procedures concerning student understanding, competencies, and attitudes relative to bodies of facts and principles and use of their intellectual and physical abilities.

B. Student Educational Career Development
- Measures and procedures concerning student attitudes and success relative to certain academic pursuits, e.g., student educational degree aspirations and attainments.

C. Student Educational Satisfaction
- Measures and procedures concerning the satisfaction of students about the knowledge and skills they have acquired and their progress toward their educational and occupational career objectives.

D. Student Occupational Career Development
- Measures and procedures concerning student attitudes and success relative to certain occupational goals and their job performance.

E. Student Personal Development*
- Information about changes in students concerning the growth and maintenance of their personal life, e.g., their ability to adapt to new situations, their self-concept.

F. Student Social/Cultural Development*
- Information about student abilities and attitudes in dealing with people and their interest in cultural activities.

NEW KNOWLEDGE AND ART FORMS

G. Development of New Knowledge
- Measures and procedures concerning forms of new knowledge developed, applied, and reorganized by an institution's programs and its faculty, staff, and students (current and former).

H. Development of Art Forms*
- Measures and procedures concerning forms of art, e.g., a musical score, a play, a sculpture, created by an institution's programs and its faculty, staff, and students (current and former).

COMMUNITY IMPACT

I. Community Impact: Education
- Measures and procedures concerning the attitudes and success of non-degree/diploma/certificate participants relative to their acquisition of knowledge and skills, personal and social development, and occupational career goals and performance.

J. Community Impact: Service
- Measures and procedures concerning the impact of the opportunities and services provided by the institution and received by the community, e.g., agricultural extension services, cultural and recreational opportunities.

K. Community Impact: Economic
- Measures and procedures concerning the impact of an institution's programs and its faculty, staff, and students (current and former) on the financial health and manpower supply of the community (local, state, or national).

*In this version of the Manual there are no measures and procedures presented for three categories: Student Personal Development, Student Social/Cultural Development, and Development of Art Forms. These omissions reflect the priorities established as a result of NCHEMS Higher Education Outcome Measures Identification Study. Later versions of the Manual may include measures appropriate for these categories.

4. The data sources from which the data needed for the measure can be obtained.

5. A listing of the general type of procedures recommended for obtaining the measure.

6. Comments that may be useful in understanding the use of the measure and its acquisition procedures.

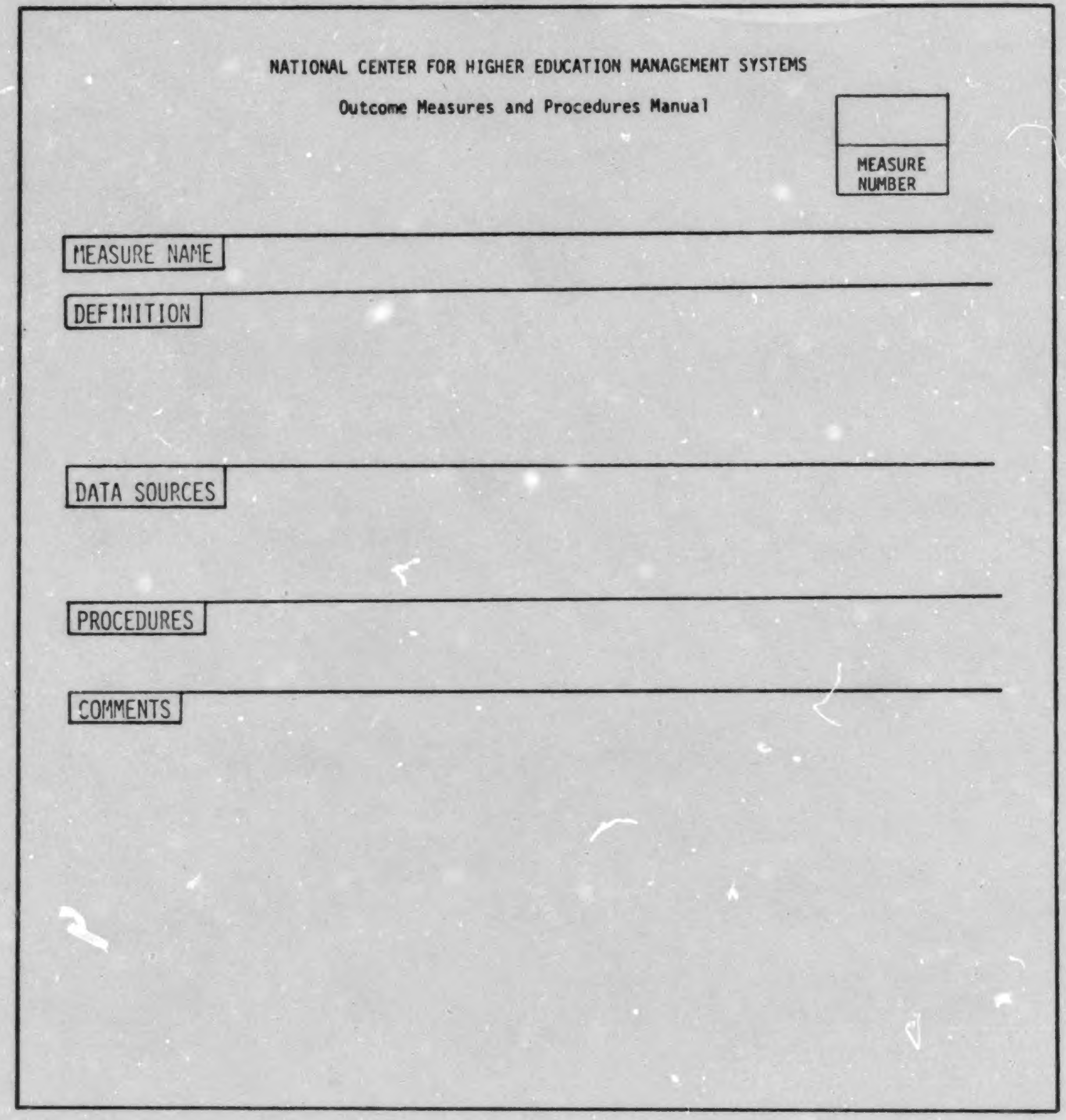
A blank copy of the abstract sheet is shown in Figure 4. Following the one-page abstract for each measure, the data acquisition procedures suggested for that measure are presented. In some instances, alternative procedures are presented to give the user as much flexibility as possible in acquiring the data necessary for the measure. For instance, procedures may differ with respect to data collection mechanisms (institutional records versus questionnaire surveys) or data sources (surveys of exiting students, former students, or administrative staff).

Procedures for Using the Manual

Using the Outcome Measures and Procedures Manual should be a fairly straightforward process. Figure 5 outlines the major steps involved. The first step actually does not involve use of the manual at all, but rather is prerequisite to using it--the determination of outcome information requirements. There are various purposes for or reasons why one might be interested in collecting outcome information: (1) the need to assess the extent to which certain institutional or program objectives are being met, (2) the need to answer a particular question related to some problem that must be solved, and (3) the need to be accountable to some external governing or funding body, such as a

Figure 4

A SAMPLE OF THE ABSTRACT SHEET USED TO INTRODUCE EACH MEASURE AND ITS RELATED PROCEDURES



NATIONAL CENTER FOR HIGHER EDUCATION MANAGEMENT SYSTEMS

Outcome Measures and Procedures Manual

MEASURE NUMBER

MEASURE NAME

DEFINITION

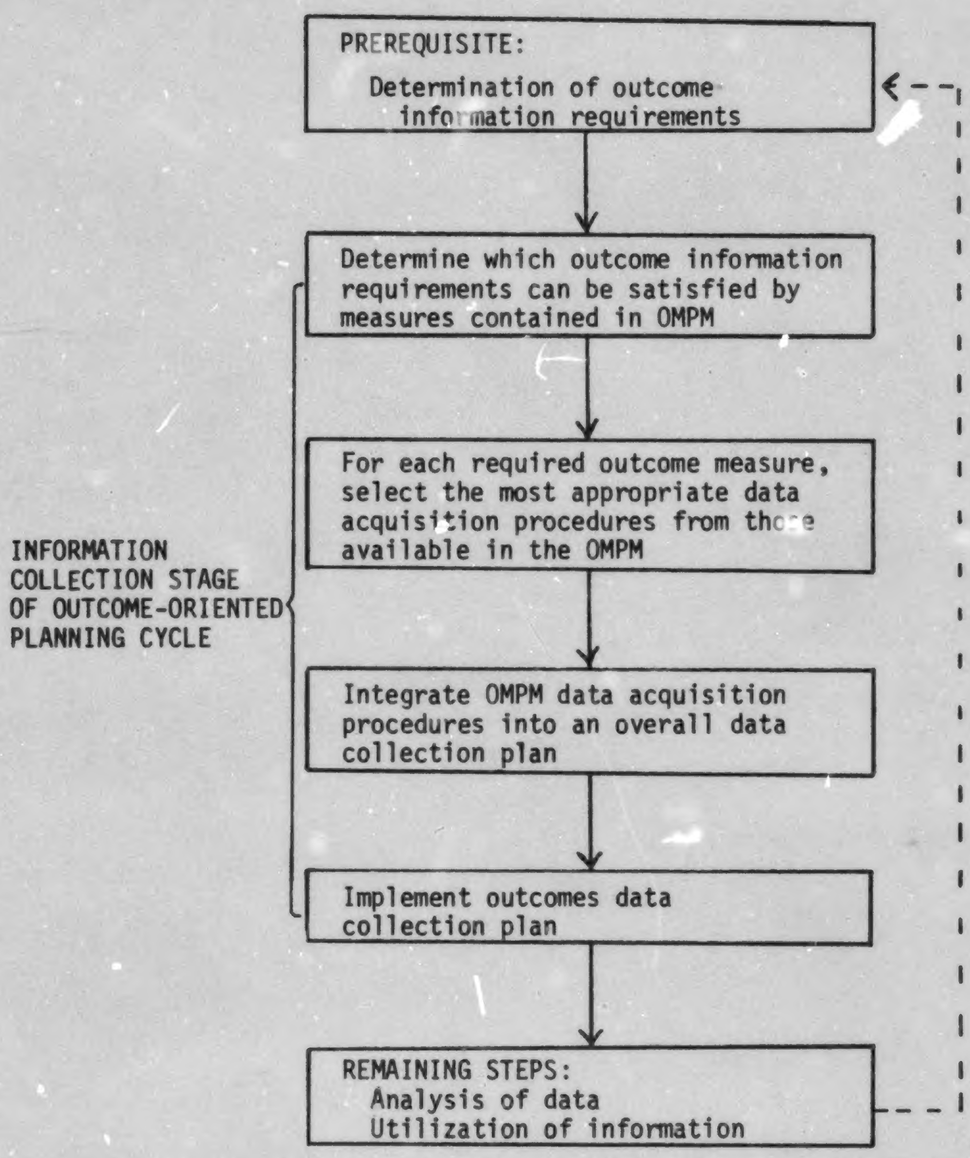
DATA SOURCES

PROCEDURES

COMMENTS

Figure 5

USE OF THE MANUAL


PREREQUISITE:
Determination of outcome information requirements
Determine which outcome information requirements can be satisfied by measures contained in OMPM
For each required outcome measure, select the most appropriate data acquisition procedures from those available in the OMPM
INFORMATION COLLECTION STAGE OF OUTCOME-ORIENTED PLANNING CYCLE
Integrate OMPM data acquisition procedures into an overall data collection plan
Implement outcomes data collection plan
REMAINING STEPS:
Analysis of data
Utilization of information

board of trustees or a state legislative appropriations committee. In establishing the plan for collecting the outcome information, the design of the study required by the questions or hypotheses of interest needs to be developed, the sampling procedures need to be determined, and the variables to be measured need to be identified.

Once the outcome information requirements have been identified, the user can begin determining which outcome measures included in the manual will help in satisfying the outcome information requirement. This can be done by going to Sections II, III, and IV of the manual and picking the relevant outcome measures.

For each of the outcome measures that help satisfy the outcome information requirements, the user should assess the appropriateness of the data acquisition procedures recommended in the manual. In some instances, the user will have to choose between alternative data collection procedures for an individual measure. While adaptations of the procedures will need to be made for the unique purposes of each study, the procedures for obtaining the outcome measures have been developed so that users usually will have to make only minimal modifications.

In using the manual it is important to note that the data acquisition procedures presented involve the use of survey questionnaires and institutional records. Because it is anticipated that survey questionnaires will be employed quite frequently, guidelines for developing, administering, and processing survey questionnaires are presented in Appendix D of the manual.

Although the outcome measures and associated data acquisition procedures are presented individually in the manual, prospective users will most likely use combinations of these measures and procedures because of their wide range of outcome information needs. Thus, the final major step in using the manual is to integrate the selected procedures into the established overall information collection plan. This may include developing an exiting student questionnaire, a follow-up questionnaire for former students, a community input survey questionnaire, a faculty activity questionnaire, and so forth. Once this is done the user can implement the data acquisition procedures according to the overall plan.

Limitations of the Manual

As with any document of this type, certain limitations are present. The most important limitations of this version of the Outcome Measures and Procedures Manual are as follows:

1. The outcome measures included in this manual represent only a limited subset of all the potential measures of postsecondary education outcomes. Measures that are included, however, are cnnsistent with the priorities expressed by the institutional administrators and state-level decision makers surveyed in the NCHEMS Higher Education Outcome Measures Identification Study. The Inventory of Higher Education Outcome Variables and Measures presented in Appendix A provides a more comprehensive view of the range of possible postsecondary education outcomes.

2. The measures and acquisition procedures presented in this manual generate only outcome information. Although outcome information is basic to the outcome-oriented planning, management, and evaluation cycle, it is important to point out that information about the resources and processes associated with the program or organization unit in focus also is necessary for describing and explaining the outcomes of those units.
3. Only those outcomes that are measurable or observable, that is, quantifiable outcomes, are included in the manual.
4. The data acquisition procedures in the manual deal only with institutionally collected information. Modifications probably will be necessary if the procedures are to be used by persons who are not institutionally based, such as state-level educational planners and decision makers.

SECTION II

STUDENT GROWTH AND DEVELOPMENT

MEASURES AND PROCEDURES

The outcome data acquisition procedures presented in this section are intended to obtain selected outcome measures that potentially reflect the outputs and impacts of postsecondary institutions and their programs relative to the broad area of student growth and development. Decision makers might be interested in one or more of these outcome measures for a variety of reasons: the measures may reflect the goals of an institution or a program therein, they may provide information needed for curricular and instructional development decisions, they may suggest areas for improved counseling and advising of students, and they may indicate why students are satisfied or dissatisfied with their educational progress and their ability to pursue their desired profession.

The data acquisition procedures included in this section pertain to the following outcome measures:

A. Student Knowledge and Skills Development Outcomes

- A-1 Student development concerning breadth of knowledge
- A-2 Student development concerning depth of knowledge
- A-3 Student success in passing certification and licensing examinations
- A-4 Areas and agents of student change during college

B. Student Educational Career Development Outcomes

- B-1 Highest degree or certificate planned
- B-2 Students enrolled in an organized educational activity for no credit
- B-3 Program completers during a certain time period
- B-4 Program completers who entered as transfer students
- B-5 Degrees and certificates earned by an entering class of students

B-6 Time to program completion for a graduating class
B-7 Time to program completion for an entering class
B-8 Educational program dropouts
B-9 Students seeking additional degrees and certificates
B-10 Students working toward and receiving another degree or certificate
B-11 Student ability to transfer credits
B-12 Level of achievement of former students in another institution

C. Student Educational Satisfaction Outcomes

C-1 Student satisfaction with overall educational experience
C-2 Student satisfaction with vocational preparation
C-3 Student satisfaction with knowledge and skills in the humanities
C-4 Student satisfaction with critical thinking ability
C-5 Student satisfaction with human relations skills

D. Student Occupational Career Development Outcomes

D-1 Student success in obtaining first job
D-2 Student success in obtaining preferred first job
D-3 Occupational career choice
D-4 Job satisfaction
D-5 First job earnings
D-6 Annual total income of former students
D-7 Employment in major field of study
D-8 Change and stability of career goals

E. Student Personal Development (No outcome measures and data acquisition procedures are presented in this category in this version of the manual.)

F. Student Social/Cultural Development (No outcome measures and data acquisition procedures are presented in this category in this version of the manual.)

In most instances, the results of NCHEMS's Higher Education Outcome Measures Identification Study were the determining factor in selecting the measures for inclusion in this section.

In using any of the student outcome measures presented here, consideration should be given to variables concerning student inputs, the institutional environment, and the educational process that potentially relate to those outcome measures. For example, student demographic variables, such as age, sex, race, residence, and marital status, should be considered. Also, student activity variables, such as major field of study, work experience, degrees earned, and grade point average, need to be considered.

Among institutional environment and educational process variables, certainly differences in faculty morale and campus intellectual orientation would be expected to have different effects on student growth and development outcomes. Furthermore, the institution's organizational structure, the different types of instructional methodologies and arrangements, and faculty accessibility to students may be important factors. Extra-institutional variables such as the political-social environment and job opportunities also should be examined for their relationships to any of the student outcome measures.

A good start on reviewing relationships of student outcomes to other factors has been made by Feldman and Newcombe (1969) and by Lenning and associates (1974, 1975).

A. Student Knowledge and Skills Development Outcomes

A-1 Student development concerning breadth of knowledge
A-2 Student development concerning depth of knowledge
A-3 Student success in passing certification and licensing examinations
A-4 Areas and agents of student change during college

A-1
MEASURE NUMBER

MEASURE NAME Student development concerning breadth of knowledge

DEFINITION

Student scores on tests that indicate development in their breadth of knowledge about facts and principles across several broad fields of study (the humanities, the physical sciences, etc.)

DATA SOURCES

Current Students, Exiting Students, Former Students

PROCEDURES

Administration of standardized achievement tests

COMMENTS

This outcome measure is identified as a potential measure of General Knowledge (1.1.1.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE A-1

The data acquisition procedures most widely used to assess student development in their breadth of knowledge is the survey achievement test. Generally, such tests represent a standardized package of separate tests that cover the basic knowledge and skill components of the curriculum. Because a variety of standardized achievement tests already have been developed, NCHEMS has chosen to recommend their use in obtaining data for outcome measure A-1. Probably the best source of information for deciding which achievement test best fits the situation in which it will be used is the series of Mental Measurements Yearbooks developed by Oscar K. Buros (1938, 1941, 1949, 1953, 1959, 1965, 1972). The following achievement test batteries, which may be useful in obtaining outcome measure A-1, are reviewed in Volume I of the seventh edition of the Mental Measurements Yearbook:

- Adult Basic Education Student Survey (Follet Educational Corporation, 1966-67)
- Adult Basic Learning Examination (Harcourt, Brace, Jovanovich, Inc., 1967-71)
- College-Level Examination Program General Examination (College Entrance Examination Board, 1970)
- Survey of College Achievement (Educational Testing Service, 1966-69)
- Tests of General Educational Development (The American Council on Education, 1970)
- The Undergraduate Record Examinations: Area Tests (Educational Testing Service, 1954-70)

A-2
MEASURE NUMBER

EASURE NAME Student development concerning depth of knowledge

EFINITION

Student scores on tests that indicate development in their depth of knowledge concerning facts and principles in the particular fields in which students elect to study.

DATA SOURCES

Current Students, Exiting Students, Former Students

PROCEDURES

Administration of standardized achievement tests

COMMENTS

This outcome measure is identified as a potential measure of Specialized Knowledge (1.1.1.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE A-2

Numerous standardized achievement tests have been developed to help assess student knowledge and skill development in special areas of study. Because of their existence, NCHEMS recommends their use in obtaining data for outcome measure A-2. As is true for outcome measure A-1, Buros' Mental Measurements Yearbooks (1938, 1941, 1949, 1953, 1959, 1965, 1972) are probably the best source of information for deciding which achievement tests best fit the situation in which they will be used. Volumes I and II of the seventh edition of the Mental Measurements Yearbook list standardized instruments for the following specialized fields of study:

English
Fine Arts
Foreign Languages
Mathematics
Business Education
Education
Health and Physical Education
Home Economics
Industrial Arts
Philosophy
Psychology
Religious Education
Reading
Biology
Chemistry
Geology
Physics
Economics
Geography
History
Political Science
Sociology
Speech and Hearing
Accounting
Business
Computer Programming
Dentistry
Engineering
Law
Medicine
Nursing
Selling
Skill Trades
Supervision
Transportation

A-3
MEASURE NUMBER

MEASURE NAME Student success in passing certification and licensing examinations

DEFINITION

Number and percentage of students and/or former students passing certification, licensing, or qualification examinations (e.g., Bar Exam, CPA Exam, LPN Exam)

DATA SOURCES

Exiting Students, Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Specialized Knowledge (1.1.1.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

Although the administration of a survey questionnaire is the acquisition procedure suggested for obtaining data for outcome measure A-3, it is recognized that the data necessary for this measure often can be obtained from the agencies or organizations that administer the exams.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE A-3

The procedure recommended for determining student success in passing certification and licensing examinations involves the development and use of a survey questionnaire. Because data for this measure can be obtained from students as they leave the institution and from former students sometime after they have left, one set of questionnaire items has been developed for inclusion in an EXITING-STUDENT Questionnaire and another set for inclusion in a FORMER-STUDENT Questionnaire.

Procedures for an EXITING-STUDENT Questionnaire

The following items that have been developed for inclusion in an EXITING-STUDENT Questionnaire to obtain data for outcome measure A-3 can be used in questionnaires designed to survey program completers as well as program noncompleters. It should be noted, however, that these items could be used also to survey students not in degree, diploma, certificate programs, that is, nonmatriculating students.

1. Have you taken or are you planning to take some type of certifying, licensing, or qualifying exam (such as Licensed Practical Nurse exam or Bar exam) either immediately after completing your program at (Name of Institution) or at some future date?

____(1) Yes (GO TO QUESTION 2)

____(2) No (SKIP TO QUESTION ___)

____(3) Don't Know (SKIP TO QUESTION ___)

2. If you answered "Yes" to question 1, how many times have you taken the exam? (Please check one.)

____(1) I have not taken it

____(2) Once

____(3) Twice

____(4) More than twice

3. If you have taken the exam, did you pass it?

____(1) Yes

____(2) No

____(3) Don't know

4. In the space below, please describe or give the name of the exam you have taken (or have to take).

____

Procedures for a FORMER-STUDENT Questionnaire

The following questionnaire items are intended for use in obtaining outcome measure A-3 from former students regardless of whether or not they completed their program.

1. Did you have to take some type of certifying, licensing or qualifying examination (such as Licensed Practical Nurse exam or Bar exam) after leaving (Name of Institution)?

_____(1) Yes (GO TO QUESTION 2)

_____(2) No (SKIP TO QUESTION __)

2. How many times did you take the exam? (Please check one.)

_____(1) I have never taken it

_____(2) Once

_____(3) Twice

_____(4) More than twice

3. If you did take the exam, did you pass it?

_____(1) Yes

_____(2) No

_____(3) Don't know

4. In the space below, please describe or give the name of the exam you had to take:

____

A-4
MEASURE NUMBER

MEASURE NAME Areas and agents of student change during college

DEFINITION

Student scores on a scale measuring their perceptions about how much they changed in certain areas as a result of experiences with various "change agents" (persons, events, facilities, or organizations) associated with the institution.

DATA SOURCES

Exiting Students, Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of a student's Intellectual Disposition (1.1.3.01) and Change/Stability (1.3.2.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURE FOR OUTCOME MEASURE A-4

Two alternative procedures are suggested for obtaining student perceptions about the areas in which they have changed as a result of experiences with certain "change agents" during college. The first alternative is a modification of a procedure developed by Evert K. Wilson at Antioch College and is described in a book he co-authored with Theodore Newcomb, College Peer Groups, (1966). The procedure represents a straight-forward approach of asking a student two basic questions: "As you reflect upon your college experience, what do you see as significant changes in yourself which have occurred during this period?" and "How did these changes come about?" The data obtained from the use of this procedure may suggest answers to questions such as: (1) Who or what are the agents of change cited by students? (2) Where does a particular change agent appear to stand among other agents of change? (3) What are the kinds of changes that students deem significant--for example, Wilson was interested in those student changes pointing to variables that might prove of interest in research on peer groups' influence. (4) How does strength of a particular change agent's influence shift from one type of variable to another?

The second alternative procedure has been used in the NCHEMS Information Exchange Procedures project's "Student Outcomes Questionnaire for Program Completers" (Byers, 1975). The procedure is designed to obtain student perceptions about: (1) how much the institution has influenced their progress or change in some potential areas of change, and (2) how significant is progress in each of those areas of change.

Procedures for an EXITING-STUDENT or FORMER-STUDENT Questionnaire

Alternative #1

In the modified version of Wilson's procedure presented below, "agents of change" are not identified specifically. Instead, spaces are provided for the user of the instrument to insert the "agents of change" he or she is interested in studying. The following list suggests some "agents of change" that might be inserted:

- courses
- faculty
- fellow students
- general maturity
- work experience
- library staff and facilities
- cultural events sponsored by the institution
- student union staff and facilities
- athletic events and facilities
- social organizations affiliated with the institution
- educational forums, workshops, etc.
- experiences in the local community

In addition to the user pre-specifying certain "agents of change," another option that might be considered is to leave one of the boxes open so the student could insert his or her significant "agents of change."

It also should be noted that while a list of seven "types of change" has been suggested in the questionnaire format below, it can be modified to meet the purposes of the study.

Directions: For each of the "TYPES OF CHANGE" listed along the left-hand side of the page, please rate how much you have changed "OVERALL" and then rate how much influence each "AGENT OF CHANGE" has had in causing that change. In each column, please check (✓) the space below the number that most accurately reflects the amount of change.

KEY: 3 = Very much change
2 = Some change
1 = Little/no change

TYPES OF CHANGE	A. OVERALL CHANGE	B. AGENTS OF CHANGE				
	3 2 1	3 2 1	3 2 1	3 2 1	3 2 1	3 2 1
1. Development of a world view and personal philosophy	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _
2. Development of an interest in new fields of learning	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _
3. Development of general thinking skills	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _
4. Development of an identity and sense of self-confidence	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _
5. Development of social skills	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _
6. Development of career plans and skills	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _
7. Development of a positive attitude towards this college	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _	_ _ _

Alternative #2:

It should be noted that rather than having a student focus on multiple agents of change, as is the case in the previous alternative, this alternative procedure, which is presented on the next page, asks a student to focus on only one change agent--the institution.

1. There are many reasons for pursuing education, some of which are listed below. In thinking over your educational experience, how much do you think this institution contributed to your progress in each area? (Check the appropriate box to the right of each category.)

		No Progress (1)	Little Progress (2)	Moderate Progress (3)	Much Progress (4)	Very Much Progress (5)
A.	Intellectual Growth: Your ability to understand and use concepts and principles from several broad areas of learning.	___	___	___	___	___
B.	Social Growth: Your understanding of other people and their views; your experience in relating to others.	___	___	___	___	___
C.	Aesthetic and Cultural Growth: Your awareness and appreciation of the literature, music, art, and drama of your own culture and of others.	___	___	___	___	___
D.	Educational Growth: Your understanding of a particular field of knowledge; your preparation for further education.	___	___	___	___	___
E.	Vocational and Professional Growth: Your preparation for employment in a particular vocational or professional area.	___	___	___	___	___
F.	Personal Growth: Your development of attitudes, values, beliefs, and a particular philosophy of life; your understanding and acceptance of yourself as a person; your ability to be realistic and adaptable and to make decisions about your own future.	___	___	___	___	___

2. How important is that progress to you? (Check the appropriate box to the right of each category.)

		No Progress (1)	Little Progress (2)	Moderate Progress (3)	Much Progress (4)	Very Much Progress (5)
A.	Intellectual Growth: Your ability to understand and use concepts and principles from several broad areas of learning.	___	___	___	___	___
B.	Social Growth: Your understanding of other people and their views; your experience in relating to others.	___	___	___	___	___
C.	Aesthetic and Cultural Growth: Your awareness and appreciation of the literature, music, art, and drama of your own culture and of others.	___	___	___	___	___
D.	Educational Growth: Your understanding of a particular field of knowledge; your preparation for further education.	___	___	___	___	___
E.	Vocational and Professional Growth: Your preparation for employment in a particular vocational or professional area.	___	___	___	___	___
F.	Personal Growth: Your development of attitudes, values, beliefs, and a particular philosophy of life; your understanding and acceptance of yourself as a person; your ability to be realistic and adaptable and to make decisions about your own future.	___	___	___	___	___

B. Student Educational Career Development Outcomes

B-1 Highest degree or certificate planned
B-2 Students enrolled in an organized educational activity for no credits
B-3 Program completers during a certain time period
B-4 Program completers who entered as transfer students
B-5 Degrees and certificates earned by an entering class of students
B-6 Time to program completion for a *graduating* class
B-7 Time to program completion for an *entering* class
B-8 Educational program dropouts
B-9 Students seeking additional degrees and certificates
B-10 Students working toward and receiving another degree or certificate
B-11 Student ability to transfer credits
B-12 Level of achievement of former students in another institution

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B-1

MEASURE NUMBER

EASURE NAME Highest degree or certificate planned

EFINITION

Number and percentage of students and/or former students identifying a certain degree or certificate as the highest planned

ATA SOURCES

Current Students, Exiting Students, Former Students

ROCEDURES

Administration of a survey questionnaire

OMMENTS

This outcome measure is identified as a potential measure of a person's Educational Aspirations (1.4.2.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

This measure can be used as an indicator of the educational or competency level desired and valued by students (student educational aspirations). If collected from students at entrance, in progress, at exit, and after they have left the institution (for example, two years later), the measure can provide information about changes in the educational aspirations of students.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-1

Data for outcome measure B-1 can be obtained using a survey questionnaire completed by students currently enrolled in the institution, students as they are leaving, and former students sometime after they have left. It should be noted that the questionnaire items developed for obtaining data for this measure are comparable to those used in the American Council on Education's longitudinal follow-up study of college students by Astin and Panos (1969). As a result, comparisons can be made between the results of the ACE follow-up study and the results derived from the use of these items.

Similar items are included in the college entrance batteries of the American College Testing Program and the College Entrance Examination Board. This may mean that information already is available for entering freshmen. Furthermore, both organizations annually develop various types of norms for such variables.

Procedures for CURRENT-, EXITING-, and/or FORMER-STUDENT Questionnaires

The following items are appropriate for inclusion in questionnaires designed to obtain outcome measure B-1 from CURRENT STUDENTS, EXITING STUDENTS (program completers and noncompleters), and/or FORMER STUDENTS (graduates and nongraduates). The second item, which asks the respondent to identify when he or she plans to complete the highest degree or certificate, should be considered optional.

Measure B-1: CURRENT-, EXITING,- and/or FORMER-STUDENT Questionnaire

1. What is the highest degree or certificate you eventually plan to complete? (Please check one.)

_____(1) Certificate

_____(2) Diploma (Other than those listed below)

_____(3) Associate degree

_____(4) Bachelor's degree

_____(5) Master's degree

_____(6) Professional degree (Include only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)

_____(7) Doctorate (e.g., Ph.D., Ed.D., D.B.A.)

_____(8) Other (Please specify) ______________________________

_____(9) Undecided

2. When do you expect to attain your planned highest level of education? (Please check one.)

_____(1) I have already obtained it

_____(2) This year (1975)

_____(3) 1976

_____(4) 1977

_____(5) 1978

_____(6) 1979

_____(7) 1980

_____(8) After 1980

_____(9) Not sure

NOTE: When using this item, substitute the number of years ahead of the base year.

If it is desirable to know the major field of study that will be associated with the highest degree a respondent plans to complete, the following alternative item can be inserted in place of the first item presented above. Note: this item will need to be accompanied by a coded list of majors. Appendix B presents two lists of occupations and educational programs that can be used by students to code their major. The first list has been developed by NCHEMS for use in the "Student Outcomes Questionnaire for Program Completers" being implemented as part of the NCHEMS Information Exchange Procedures project. The second list of majors has been developed and used by the American College Testing Program. If your institution participates in the ACT program, use of the ACT list of majors would allow comparisons of student choices at different points in time.

1.a. What is the highest degree or certificate you eventually plan to complete? (Please check one.)

_____(1) Certificate

_____(2) Diploma (Other than those listed below)

_____(3) Associate degree

_____(4) Bachelor's degree

_____(5) Master's degree

_____(6) Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)

_____(7) Doctor's degree (e.g., Ph.D., Ed.D., D.B.A.)

_____(8) Other (Please specify) ______________________________

_____(9) Undecided

b. From the list that appears on page __, please select the entry that most closely corresponds to the field of study for the degree or certificate above and write its 3-digit code number in the space below.

Field of study: |_|_|_| ______________________________

B-2
MEASURE NUMBER

EASURE NAME

Students enrolled in an organized educational activity for no credit

EFINITION

Number and percentage of students enrolled in organized educational activities for no credit within a certain period of time

ATA SOURCES

Current Students, Exiting Students, Former Students

ROCEDURES

Search of institutional records/administration of a survey questionnaire

OMMENTS

This outcome measure is identified as a potential proxy measure of a student's Intellectual Disposition (1.1.3.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-2

Two alternative procedures have been developed for obtaining data for outcome measure B-2. The first alternative calls for the use of institutional records; the second involves the use of a survey questionnaire. The procedure for using institutional records permits data collection pertaining only to current students, while the survey questionnaire procedure can be used to obtain data for this measure from current students, exiting students, or former students.

Procedure for Use of Institutional Records

The procedure for using institutional records does not provide a means for learning about the non-credit-producing educational activities current students participate in outside the institution. If this limitation is not a concern, the following procedural steps may be useful.

1. Determine the sample of current students to be studied (such as lower division and upper division students seeking a bachelor's degree in a particular major program of study).
2. For each student in the selected sample, identify from the student enrollment records whether a student has taken a course (credit-producing or non-credit-producing) for no credit during at least one of the two most recent academic terms (summer or special academic sessions included). Students who enrolled in an organized educational activity for no credit should be counted regardless of whether they completed the course.

3. For each student who took a course for no credit, determine if the student was:
    a. enrolled in a course that was offered for credit, or
    b. enrolled in a course that was not offered for credit.
4. For a descriptive summary of the data, calculate the number and percentage of current students taking courses (both credit-producing and non-credit-producing) for no credit.

Procedure for a CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following questionnaire item developed for obtaining data for outcome measure B-2 is intended to identify (1) those current, exiting, or former students who have participated in organized educational activities for no credit, and (2) who sponsored the activities.

1. Have you participated during the last six months* in any organized educational activity that did not give you credit that could be applied to a college degree?

____(1) Yes (GO TO QUESTION 2)

____(2) No (SKIP TO QUESTION __)

2. Which of the following institutions or organizations sponsored the educational activity (or activities) in which you participated? (CHECK ALL THAT APPLY)

____(1) [Insert Name of Institution administering this questionnaire]

____(2) A college other than [Name of Institution]

____(3) A local institution (for example a church) or a local agency (for example the YMCA or the city recreation department)

____(4) Your employer

____(5) Other (Please specify) ________________________________

____

3. The type(s) of subject area(s) emphasized were ____________________

____

____

*Note that this period of time can be modified, depending on the purpose of the study.

B-3

MEASURE NUMBER

EASURE NAME

Program completers during a certain time period

EFINITION

The number and percentage of students completing a degree or certificate during a certain period of time; by student program

ATA SOURCES

Institutional Student Records

ROCEDURES

Search of Institutional Records

OMMENTS

This outcome measure is identified as a potential measure of a student's Academic Preparation (1.4.1.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-3

The procedure recommended for obtaining data for outcome measure B-3 is straight forward and requires the use of institutional records.

Procedure for Use of Institutional Records

1. For a specific period of time (such as a fiscal year), identify: (1) all students who have received a degree or certificate, and (2) all students who were eligible to receive a degree or certificate but did not complete the necessary administrative steps to actually receive the award. Many institutions may not have any degree or certificate completers of this second type or may not be able to identify those they do have.

2. For each completer, identify the type of degree or certificate he or she received (or was eligible to receive):

   Certificate
   Diploma (Other than those listed below)
   Associate degree
   Bachelor's degree
   Master's degree
   Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
   Doctorate (e.g., Ph.D., Ed.D., D.B.A.)
   Other (Please specify)________________________________
   Undecided

3. Next, identify the student program (bachelor's degree in genetics, a certificate in welding, and so forth) associated with the degree or certificate received by each program completer. The appropriate student category for each student should be determined according to his or her major at the time of graduation. You can

use one of the lists of occupations and educational programs presented in Appendix B or the Higher Education General Information Survey (HEGIS) discipline list in Appendix C to code the student programs identified. Although the HEGIS list designates disciplines, for purposes of this procedure the list can be used to designate student programs when appropriate.

4. Finally, identify each program completer's status when he or she entered the institution:
   - a. New Undergraduate Student
   - b. Transfer Undergraduate Student
   - c. New Graduate Student
   - d. Transfer Graduate Student

5. For a descriptive summary of the data, calculate the number and percentage of students completing a degree or certificate during the designated period of time, by type of student program and by student status at entrance.

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B-4
MEASURE NUMBER

MEASURE NAME

Program completers who entered as transfer students

DEFINITION

Number and percentage of students who entered as transfer students earning a degree or certificate during a certain period of time by status at entrance

DATA SOURCES

Institutional Student Records

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of Academic Preparation (1.4.1.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-4

The procedure developed for obtaining data for outcome measure B-3 should be used to obtain the data for this outcome measure, B-4.

B-5
MEASURE NUMBER

MEASURE NAME Degrees and certificates earned by an entering class of students

DEFINITION

Number and percentage of students in a designated entering class who have earned a degree or certificate from the institution within a certain period of time, by type of degree or certificate, student status at entrance, and student program (field of study)

DATA SOURCES

Institutional Records of a Designated Entering Class of Students (e.g., the entering class of 1970)

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of Academic Preparation (1.4.1.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

Measures B-5 and B-3 differ in that B-5 identifies the success an entering class has had in completing their degree or certificate programs whereas B-3 identifies those students earning a degree or certificate during a given period of time with no consideration of when they entered the institution.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-5

The procedures developed for acquiring data for outcome measure B-5 are based on the use of institutional records. It should be noted that in addition to being appropriate for identifying the number and percentage of students in an entering class who have graduated or are expected to graduate in a certain period of time, the procedures also identify those students in an entering class (1) who are currently enrolled in the institution and (2) who have left the institution without receiving a degree or certificate.

Procedure for Use of Institutional Records

1. Select the entering class to be studied. Categorize students in the entering class in terms of their student status at entrance:
    a. New Undergraduate Students
    b. Transfer Undergraduate Students
    c. New Graduate Students
    d. Transfer Graduate Students
2. Determine the cut-off date to be used in obtaining data for outcome measure B-5.
3. Examine student records for the selected entering class and identify:
    a. Those students who have earned a degree or certificate by cut-off date. Students who are eligible to receive a degree or certificate but who have not completed the necessary administrative steps to actually receive the award should be included.

b. Those students who are currently enrolled in the institution.

c. Those students who left the institution prior to completion of a degree or certificate. (This group of students would include those who have left permanently and those who may return.)

4. Identify the type of degree or certificate earned by each program completer:

   Certificate
   Diploma (Other than those listed below)
   Associate degree
   Bachelor's degree
   Master's degree
   Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
   Doctorate (e.g., Ph.D., Ed.D., D.B.A.)
   Other (Please specify)______________________________
   Undecided

5. Next identify the student major program (bachelor's degree in genetics, a certificate in welding, and so forth) for each completer. The appropriate student major program category for each student should be determined according to his or her major at the time of graduation. You can use one of the lists of occupations and educational programs presented in Appendix B or the Higher Education General Information Survey (HEGIS) discipline list in Appendix C to code the student programs identified. Although the HEGIS list designates disciplines, for purposes of this procedure the list can be used to designate student programs when appropriate.

6. For a descriptive summary of the data, calculate the number and percentage of students in the selected entering class who have earned a degree or certificate within the designated period of time, by their status at entrance and their major at graduation.

B-6
MEASURE NUMBER

EASURE NAME Time to program completion for a graduating class

EFINITION

Amount of time it takes a student in a particular graduating class to earn a degree or certificate, by degree or certificate type, student major program, and student status at entrance

DATA SOURCES

Institutional Student Records

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of Academic Preparation (1.4.1.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-6

The procedure recommended for obtaining data for outcome measure B-6, "Amount of time it takes a student in a particular graduating class to earn a degree or certificate," requires the use of student institutional records. It is important to note that this procedure does not distinguish graduates who have been enrolled on a continuous basis from those who have been enrolled on an intermittent basis. Also, the procedure does not delineate graduates who have always been full-time students from those who, at one time or another, have been part-time enrollees. If these distinctions are important, the following steps will need to be modified accordingly.

Procedure for Use of Institutional Records

1. Select the graduating class to be studied.
2. Examine institutional records for students in the graduating class and identify student status at entrance for each student:
    a. New Undergraduate Student
    b. Transfer Undergraduate Student
    c. New Graduate Student
    d. Transfer Graduate Student
3. Identify for each student the total number of months elapsed from entry date to graduation date and/or the total number of terms enrolled (summer terms and special sessions inlcuded) from entry date to graduation date.

4. Determine for each student in the study:

   a. Type of degree or certificate earned:

      Certificate
      Diploma (Other than those listed below)
      Associate degree
      Bachelor's degree
      Master's degree
      Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
      Doctorate (e.g., Ph.D., Ed.D., D.B.A.)
      Other (Please specify)__________________________
      Undecided

   b. Major program at graduation:

      Appendix B presents alternative lists of occupations and educational programs that can be used to code each graduating student's major program.

5. Data now are available to calculate the median or mean number of months elapsed and/or the median or mean number of terms enrolled by:

   a. Type of degree or certificate earned

   b. Student major program at graduation

   c. Student status at entrance

B-7

MEASURE NUMBER

EASURE NAME

Time to program completion for an entering class

EFINITION

Amount of time it takes a student in a particular entering class to earn a degree or certificate, by degree or certificate type, student major program, and student status at entrance

DATA SOURCES

Institutional Student Records

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of Academic Preparation (1.4.1.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

The procedures suggested for obtaining data for this measure allow as the basic unit of measurement either total number of months elapsed from entry date to graduation or total number of academic terms enrolled in that period of time.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-7

The procedure developed for obtaining data for outcome measure B-7, "Amount of time it takes a student in a particular entering class to earn a degree or certificate," involves the use of student institutional records. It is important to note that this procedure does not distinguish graduates who have been enrolled on a continuous basis from those who have been enrolled on an intermittent basis. Also, the procedure does not delineate graduates who have always been full-time students from those who, at one time or another, have been part-time enrollees. If these distinctions are important, the following steps will need to be modified accordingly.

Procedure for Use of Insitutitutional Records

1. Select entering class to be studied (for example, all new undergraduate students who entered Fall term of 1970).
2. Examine institutional records for the students in the designated entering class:
    a. Identify those students who have graduated or are expected to graduate by the specified cut-off date (such as Spring 1975).
    b. Identify for each student identified in step a:
        (1) total number of months elapsed from entry date to graduation date, and/or
        (2) total number of terms enrolled (summer terms and special sessions included) from entry date to graduation date.

c. Determine for each student in the study:

(1) Student status at entrance:

New Undergraduate Student

Transfer Undergraduate Student

New Graduate Student

Transfer Graduate Student

(2) Type of degree or certificate earned:

Certificate
Diploma (Other than those listed below)
Associate degree
Bachelor's degree
Master's degree
Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
Doctorate (e.g., Ph.D., Ed.D., D.B.A.)
Other (Please specify)__________________________
Undecided

(3) Major program at graduation:

Appendix B presents alternative lists of occupations and educational programs that can be used to code each student's major program at time of graduation.

3. Data now are available to calculate the median or mean number of months elapsed and/or the median or mean number of terms enrolled for each graduating student in the designated entering class by:

   a. Student status at entrance

   b. Type of degree or certificate earned

   c. Student major program at graduation

B-8
MEASURE NUMBER

MEASURE NAME

Educational program dropouts

DEFINITION

The number and percentage of full-time students in degree or certificate programs who left the institution prior to completion of their program, by student level and exit status

DATA SOURCES

Former full-time students who were seeking a degree or certificate but "dropped out" of the institution

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of Academic Preparation (1.4.1.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

The procedures that follow are not applicable to students enrolled in certificate programs that are conducted for periods of time not synonymous with regular academic sessions (e.g., a special five-week certificate program).

The information obtained for this measure should be reviewed along with information about the number of continuing and readmitted students. In combination, these measures can provide general information about the pattern of student attendance at the institution over a short period of time.

The procedure for this measure can be used to identify the group of former students who should be surveyed regarding their reasons for leaving the institution before completing their program.

NCHEMS Information Exchange Procedures Outcomes Study Procedures (Technical Report No. 66) contains a slightly modified version of the data acquisition procedures recommended for this outcome measure.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-8

The procedure recommended for obtaining data for outcome measure B-8 requires the use of institutional records. An advantage of the procedure is that it establishes a defined period of time that determines when a student should be classified as a dropout.*

Procedure for Use of Institutional Records

1. Identify all students in degree and certificate programs who were enrolled full-time at the institution at one of the following point(s) in time prior to the current Fall term:
    a. The previous semester if the institution is on a semester system with no summer session (for example, the previous semester);
    b. For at least one of the previous two terms if the institution is on a semester system in which a summer session is a regular term (for example, the previous Summer semester or Spring semester); if the summer session is divided into a number or parts, attendance during one part constitutes enrollment for the term;
    c. The previous semester if the institution is on a 4-1-4 system;
    d. For at least one of the previous two terms if the institution is on a trimester system;

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*This time period can be varied depending upon the interests of the user of this procedure.

- e. The previous quarter if the institution is on a quarter system with three quarters and no summer sessions (for example, the previous Spring quarter);
- f. For at least one of the two previous terms if the institution is on a quarter system with four quarters or three quarters and a summer session where the summer session is considered a regular term (for example, the previous Summer or Spring quarter); if the summer is divided into a number of parts, attendance during one part constitutes enrollment for the term.

2. For each student identified above, identify those who did not complete a program prior to the current Fall term.
3. For the program noncompleters identified in step 2, determine those who are not enrolled at the institution in the current Fall term. Determination of enrollment should be made as of the census date for the Fall term at the institution.
4. For each of the students identified in step 3, determine his or her status at the institution as of the end of the last term he or she was enrolled:
    - a. In Good Standing
    - b. Not in Good Standing
        - (1) Academically Dropped or Suspended
        - (2) Other
5. For each of the students identified in step 3, determine his or her student level as of the end of the last term he or she was enrolled:
    - a. Lower Division
    - b. Upper Division
    - c. Graduate

6. Data should now be available to calculate the number and percentage of full-time students in degree or certificate programs who left the institution during the designated time period prior to completion of their program, by student level and status at termination.

B-9

MEASURE NUMBER

EASURE NAME

Students seeking additional degrees and certificates

EFINITION

Number and percentage of exiting or former students who have been admitted or are seeking admission to another educational program which when completed will result in a degree or certificate, by type of degree or certificate and by student major program

ATA SOURCES

Exiting Students, Former Students

ROCEDURES

Administration of a survey questionnaire

OMMENTS

This outcome measure is identified as a potential measure of Educational Aspirations (1.4.2.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

The procedure for determining this measure has been developed so that outcome measure B-10, "Number and percentage of students working toward or receiving another degree or certificate after a certain period of time," is obtained at the same time.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-9

Since this outcome measure, B-9, and outcome measure B-10 that follows ("Students working toward and receiving another degree or certificate") are likely to be desired simultaneously, procedures involving the use of a survey questionnaire have been developed to obtain data for both outcome measures at the same time. Since data for the two outcome measures can be obtained for either exiting students or former students, two sets of questionnaire items have been developed.

Procedures for an EXITING-STUDENT Questionnaire

Item 2.b below requires the use of a coded list of student major programs. Appendix B presents alternative lists of occupations and educational programs that students can use to code their major.

Procedures for a FORMER-STUDENT Questionnaire

Two alternative procedures have been developed for inclusion in a questionnaire for former students. The first alternative is more detailed and may be more appropriate in a former-student questionnaire sent to graduates of the institution. The second alternative procedure is designed to obtain more general information about a former student's educational plans and it may be more appropriate for inclusion in a questionnaire sent to former students who have "dropped out."

Item 2.b. below requires the use of a coded list of student major programs. Appendix B presents alternative lists of occupations and educational programs that students can use to code their major.

1. Have you applied for admission to one or more educational programs (either here or at another school) that would result in your earning another degree or certificate? (PLEASE CHECK ONE)

____(1) Yes, I have applied (GO TO QUESTION 2)

____(2) No, but I intend to apply within the next year (SKIP TO QUESTION ___)

____(3) No, and I do not intend to apply within the next year (SKIP TO QUESTION ___)

2.a What kind of degree or certificate would result from the program(s) to which you have applied? (PLEASE CHECK ONE)

____(1) Certificate

____(2) Diploma (Other than those listed below)

____(3) Associate degree

____(4) Bachelor's degree

____(5) Master's degree

____(6) Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)

____(7) Doctorate (e.g., Ph.D., Ed.D., D.B.A.)

____(8) Other (Please specify) ________________________________

b. From the list that appears on page __, please select the entry that most closely corresponds to the field of study you plan to pursue and write its 3-digit code number in the space below:

Field of study: |__|__|__| ________________________________

Alternative #1:

1. Since leaving [Name of Institution], have you been admitted to another educational program (either here or at another school) which when completed would result in a degree or certificate? (PLEASE CHECK ONE)

____(1) Yes (GO TO QUESTION 2)

____(2) No, but I have applied for admission to another educational program. (GO TO QUESTION 2)

____(3) No, I was not admitted although I applied. (GO TO QUESTION 2)

____(4) No, I did not apply to any other educational program. (SKIP TO QUESTION __)

2.a. What kind of degree(s) or certificate(s) were you (or are you) seeking? (Please write in the space below a 1 if you have sought a degree or certificate but have not been awarded it, and a 2 if you have already been awarded it.)

____(1) Certificate

____(2) Diploma (Other than those listed below)

____(3) Associate degree

____(4) Bachelor's degree

____(5) Master's degree

____(6) Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)

____(7) Doctorate (e.g., Ph.D., Ed.D., D.B.A.)

____(8) Other (Please specify ______________________________

b. From the list that appears on page __, please select the entry that most closely corresponds to the field of study you most recently pursued (or are pursuing now) and write its 3-digit number in the space below:

Field of study: |__|__|__| ______________________________

Alternative #2:

1. Since leaving [Name of Institution], have you applied for admission to any other educational program (either here or at another school) that would result in your earning a degree or certificate?

____(1) Yes, I have applied and have been admitted.

____(2) Yes, I have applied but have not been admitted.

____(3) No, but I intend to apply within the next year.

____(4) No, and I do not intend to apply within the next year.

B-10
MEASURE NUMBER

EASURE NAME

Students working toward and receiving another degree or certificate

EFINITION

Number and percentage of exiting or former students who are working toward or have received another degree or certificate, by degree/diploma/certificate type and by student major program

ATA SOURCES

Exiting Students, Former Students

ROCEDURES

Administration of a Survey Questionnaire

OMMENTS

This outcome measure is identified as a potential measure of Education Aspirations (1.4.2.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-10

The procedure developed for obtaining data for outcome measure B-9 should be used to obtain the data necessary to derive this outcome measure, B-10.

B-11
MEASURE NUMBER

EASURE NAME Student ability to transfer credits

EFINITION

Number and percentage of exiting and/or former students who have successfully transferred credits to another school

DATA SOURCES

Exiting Students, Former Students

PROCEDURES

Administration of a Survey Questionnaire

COMMENTS

This measure and outcome measure B-12 may be useful as indicators of the success of former students who have enrolled in another institution.

If the procedures for this measure are used in an EXITING-STUDENT Questionnaire, it would be appropriate to include them in the section of the questionnaire that contains the exiting students' responses concerning whether they have been admitted or are seeking admission to another program. (See outcome measures B-9 and B-10.)

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-11

The procedures developed for identifying student success in transferring credits to another institution require the use of a survey questionnaire. The first questionnaire item identifies whether the respondent attempted to transfer any credits. The second question identifies reasons why respondents were not successful in transferring credits.

It should be noted that this sequence of questions usually would be asked after it was determined that the respondent had been admitted to or was attending another school. Also, it is assumed that the school to which the respondent has transferred will be identified by the respondent in the questionnaire.

1. Did you try to transfer credits from [Name of Institution] when you were admitted to your new program? (PLEASE CHECK ONE)

____(1) Yes, and they were all accepted. (SKIP TO QUESTION ___)

____(2) Yes, but some credits were not accepted. (GO TO QUESTION 2)

____(3) Yes, but none of the credits were accepted. (GO TO QUESTION 2)

____(4) No. (SKIP TO QUESTION ___)

2. What was the major reason that the credits were not accepted? (PLEASE CHECK ONE)

____(1) Don't know

____(2) No comparable course

____(3) Switched fields of study

____(4) Limit on transfer of credits

____(5) The institution does not accept transfer credits

____(6) Other (Please explain) ______________________________

____

B-12

MEASURE NUMBER

EASURE NAME Level of achievement of former students in another institution

EFINITION

Number and percentage of former students achieving a certain grade point average in another institution

DATA SOURCES

Former Students

PROCEDURES

Administration of a Survey Questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Academic Preparation (1.4.1.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

This measure and outcome measure B-11 could be useful also as indicators of the success of former students who have enrolled in another institution.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-12

The success former students have in achieving an acceptable grade point average at another shcool is often determined from grade reports sent by the schools in which the former students enroll. However, in many instances such reports are not available. As a result, the following questionnaire items have been developed to obtain data for outcome measure B-12 using a survey questionnaire for former students (graduates and nongraduates).

Procedures for a FORMER-STUDENT Questionnaire

[SEE FOLLOWING PAGE]

1. How many college credits have you earned since you left [Name of Institution]?

a. Undergraduate Credits

____(1) None
____(2) Less than 10 sem. hrs. (15 qtr. hrs.)
____(3) 10-19 sem. hrs. (15-29 qtr. hrs.)
____(4) 20-29 sem. hrs. (30-44 qtr. hrs.)
____(5) 30-39 sem. hrs. (45-59 qtr. hrs.)
____(6) 40-49 sem. hrs. (60-74 qtr. hrs.)
____(7) 50 sem. hrs. or more (75 qtr. hrs. or more)

b. Graduate Credits

____(1) None
____(2) Less than 10 sem. hrs. (15 qtr. hrs.)
____(3) 10-19 sem. hrs. (15-29 qtr. hrs.)
____(4) 20-29 sem. hrs. (30-44 qtr. hrs.)
____(5) 30-39 sem. hrs. (45-59 qtr. hrs.)
____(6) 40-49 sem. hrs. (60-74 qtr. hrs.)
____(7) 50 sem. hrs. or more (75 qtr. hrs. or more)

2. What grade point average have you attained while earning these credits? (A 4.00 G.P.A. is equivalent to a straight "A" average.)

a. Undergraduate G.P.A.

____(1) Less than 1.00
____(2) 1.00 - 1.49
____(3) 1.50 - 1.99
____(4) 2.00 - 2.49
____(5) 2.50 - 2.99
____(6) 3.00 - 3.49
____(7) 3.50 - 3.99
____(8) 4.00
____(9) Not applicable

b. Graduate G.P.A.

____(1) Less than 1.00
____(2) 1.00 - 1.49
____(3) 1.50 - 1.99
____(4) 2.00 - 2.49
____(5) 2.50 - 2.99
____(6) 3.00 - 3.49
____(7) 3.50 - 3.99
____(8) 4.00
____(9) Not applicable

C. Student Educational Satisfaction Outcomes

C-1 Student satisfaction with overall educational experience
C-2 Student satisfaction with vocational preparation
C-3 Student satisfaction with knowledge and skills in the humanities
C-4 Student satisfaction with critical thinking ability
C-5 Student satisfaction with human relations skills

C-1
MEASURE NUMBER

MEASURE NAME Student satisfaction with overall educational experience

DEFINITION

The responses of students to questionnaire items measuring the degree of satisfaction with their overall college education experience

DATA SOURCES

Current Students, Exiting Students, Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Educational Satisfaction (1.4.2.03) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE C-1

The procedure recommended for obtaining data for outcome measure C-1 calls for the use of a survey questionnaire. The particular set of questions suggested is a modification of a series of questions developed by C. Robert Pace and his associates in the Higher Education Measurement and Evaluation Kit (1975) to determine students' "general satisfaction with college."

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following series of questions is appropriate for use in questionnaire surveys of an institution's current students, exiting (program completers and noncompleters) students, and former students (graduates and nongraduates).

1. In general, how well do you like attending college?

_____(1) I don't like it

_____(2) I am more or less neutral about it

_____(3) I like it

_____(4) I am enthusiastic about it

2. If you could start over again, would you still choose to attend (Name of Institution)?

_____(1) Definitely no

_____(2) Probably no

_____(3) Probably yes

_____(4) Definitely yes

3. Regardless of any vocational benefit college may have for you at this point in time, do you think that being in college is a very important and beneficial experience?

_____(1) Definitely no Why? ______________________________

_____(2) Generally no ______________________________

_____(3) Generally yes ______________________________

_____(4) Definitely yes ______________________________

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C-2
MEASURE NUMBER

MEASURE NAME Student satisfaction with vocational preparation

DEFINITION

The responses of students to questionnaire items measuring the degree of satisfaction with their vocational preparation

DATA SOURCES

Current Students, Exiting Students, Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Vocational Preparation (1.4.1.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE C-2

The procedure recommended for assessing student satisfaction with vocational preparation requires the use of a survey questionnaire. The questionnaire items and format used to derive this measure are a modified version of the "Educational Benefits: Vocational Scale," which is included in the Higher Education Measurement and Evaluation Kit (1975) developed by C. Robert Pace and his associates at the Center for the Study of Evaluation, University of California, Los Angeles. The scale is intended to measure the extent to which students or former students feel their college work and experience have benefited them in achieving certain vocational preparation goals.

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following scale is appropriate for use in questionnaire surveys of current students, exiting students, and former students.

1. In thinking over your educational experiences at (Name of Institution), to what extent do you think these experiences contributed to your progress in each of the following areas?

Please check (✓) the appropriate box to the right of each category.

	(1) Very Little	(2) Some	(3) Quite A Bit	(4) Very Much
A. Background and specialization for further education in some professional, scientific or scholarly field.	___	___	___	___
B. Basis for improved social and economic status.	___	___	___	___
C. Vocabulary, terminology, and facts in various fields of knowledge.	___	___	___	___
D. Skills and techniques directly applicable to a job.	___	___	___	___

C-3
MEASURE NUMBER

MEASURE NAME Student satisfaction with knowledge and skills in the humanities area

DEFINITION

The responses of students to questionnaire items measuring the degree of satisfaction with their knowledge and skills in the humanities, including philosophy, literature, the arts, and language

DATA SOURCES

Current Students, Exiting Students, Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Specialized Knowledge (1.1.1.02) and Communication Skills (1.1.4.04) in NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE C-3

The procedure recommended for assessing student satisfaction with knowledge and skills in the humanities area requires the use of a survey questionnaire. The questionnaire items and format used to derive this measure are a modified version of the "Educational Benefits: Humanistic Scale," which is presented in the Higher Education Measurement and Evaluation Kit developed by C. Robert Pace and his associates at the Center for the Study of Evaluation, University of California, Los Angeles (1975). The scale is intended to measure the extent to which students or former students feel their college work and experience have benefited them in achieving certain goals related to knowledge and skills in the humanities.

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following scale is appropriate for use in questionnaire surveys of current students, exiting students (program completers and noncompleters), and former students (graduates and nongraduates).

1. In thinking over your educational experiences at (Name of Institution), to what extent do you think these experiences contributed to your progress in each of the following areas?

Please check (✓) the appropriate box to the right of each category.

	(1) Very Little	(2) Some	(3) Quite A Bit	(4) Very Much
A. Awareness of different philosophies, cultures, and ways of life.	___	___	___	___
B. Broadened literary acquaintance and appreciation.	___	___	___	___
C. Aesthetic sensitivity; Appreciation and enjoyment of art, music, drama.	___	___	___	___
D. Writing and speaking: clear, correct, effective communication.	___	___	___	___

C-4

MEASURE NUMBER

MEASURE NAME Student satisfaction with critical thinking ability

DEFINITION

The responses of students to questionnaire items measuring the degree of satisfaction with their ability to formulate and analyze problems

DATA SOURCES

Current Students, Exiting Students, Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Critical Thinking and Reasoning Skills (1.1.2.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE C-4

The procedure recommended for assessing student satisfaction with critical thinking ability requires the use of a survey questionnaire. The questionnaire items and format used to derive this measure are a modified version of the "Educational Benefits: Critical Thinking Scale," which is presented in the Higher Education Measurement and Evaluation Kit developed by C. Robert Pace and his associates at the Center for the Study of Evaluation, University of California, Los Angeles (1975). The scale is intended to measure the extent to which students or former students feel their college work and experience have benefited them in achieving certain goals related to intellectual skills and abilities.

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following scale is appropriate for use in questionnaire surveys of current students, exiting students (program completers and noncompleters), and former students (graduates and nongraduates).

1. In thinking over your educational experiences at (Name of Institution), to what extent do you think these experiences contributed to your progress in each of the following areas?

Please check (✓) the appropriate box to the right of each category.

	(1) Very Little	(2) Some	(3) Quite A Bit	(4) Very Much
A. Reasoning ability: recognizing assumptions, making logical inferences, and reaching correct conclusions.	___	___	___	___
B. Ability to see relationships, similarities, and differences between ideas.	___	___	___	___
C. Understanding the nature of science, experimentation and theory.	___	___	___	___
D. Critical thinking: ability to withhold judgment, raise questions, and examine contrary views.	___	___	___	___
E. Quantitative thinking: understanding concepts of probability, proportion, margin of error.	___	___	___	___

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C-5
MEASURE NUMBER

ASURE NAME

Student satisfaction with human relations skills

FINITION

The responses of students to questionnaire items measuring the degree of satisfaction with their progress in achieving human relations skills

TA SOURCES

Current Students, Exiting Students, Former Students

OCEDURES

Administration of a survey questionnaire

MMENTS

This outcome measure is identified as a potential measure of Interpersonal Participation (1.2.1.01) and Social Conscience (1.2.2.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE C-5

The procedure recommended for assessing student satisfaction with human realtions skills requires the use of a survey questionnaire. The questionnaire items and format used to derive this measure are a modified version of the "Educational Benefits: Human Relations Scale," which is presented in the Higher Education Measurement and Evaluation Kit developed by C. Robert Pace and his associates at the Center for the Study of Evaluation, University of California, Los Angeles (1975). The scale is intended to measure the extent to which students or former students feel their college work and experience have benefited them in achieving certain human relations skill goals.

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following scale is appropriate for use in questionnaire surveys of current students, exiting students (program completers and noncompleters), and former students (graduates and nongraduates).

1. In thinking over your educational experiences at (Name of Institution), to what extent do you think these experiences contributed to your progress in each of the following areas?

Please check (✓) the appropriate box to the right of each category.

	(1) Very Little	(2) Some	(3) Quite A Bit	(4) Very Much
A. Personal development: understanding one's abilities and limitations, interests, and standards of behavior.	—	—	—	—
B. Development of friendships and loyalties of lasting value.	—	—	—	—
C. Appreciation of individuality and independence of thought and action.	—	—	—	—
D. Social development: experience and skill in relating to other people.	—	—	—	—
E. Tolerance and understanding of other people and their views.	—	—	—	—
F. Appreciation of religion: moral and ethical standards.	—	—	—	—

D. Student Occupational Career Development Outcomes

D-1 Student success in obtaining *first* job
D-2 Student success in obtaining *preferred first* job
D-3 Occupational career choice
D-4 Job satisfaction
D-5 First job earnings
D-6 Annual total income of former students
D-7 Employment in major field of study
D-8 Change and stability of career goals

D-1
MEASURE NUMBER

MEASURE NAME Student success in obtaining first job

DEFINITION

Number and percentage of students (graduates and nongraduates) who are employed within a certain time period after leaving the institution

DATA SOURCES

Exiting Students, Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Vocational Preparation (1.4.1.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-1

The procedure recommended for obtaining data for outcome measure D-1 requires the use of a survey questionnaire. In addition to the questionnaire items, several items have been included to gain the respondents' perceptions about (1) how they regard their first job, (2) how they found it, and (3) its linkage to their major field of study.

Procedure for an EXITING-STUDENT Questionnaire

[SEE NEXT PAGE]

1. Do you currently hold or have you secured a full-time job (35 hours or more a week) in which you plan to work once you complete your studies at (Name of Institution)?

____(1) Yes (GO TO QUESTION 2)

____(2) No (SKIP TO QUESTION 9)

2. For whom do you (or will you) work? (Name of employing firm)

____

City ________ State_________ Zip_____

3. What kind of business or industry is the job in? (For example, accounting firm, public school, TV manufacturer)

____

4. What kind of work does the job involve? (For example, accounting, teaching, electrical engineering, welding)

____

5. Are you (or will you be):

____(1) An employee of a private business?

____(2) Self-employed in your own business?

____(3) An employee of local, state or federal government?

____(4) A public employee of a non-governmental organization? (For example, an environmental agency)

6. Which statement best describes how you regard this job at this time? (Please check one)

____(1) Temporary job until a better one can be found.

____(2) Temporary job while waiting to report to a new job.

____(3) Temporary job to earn money to do something else (travel, school, have free time, etc.).

____(4) Job to earn money while I decide what kind of work I want.

____(5) Job with possible career potential.

____(6) Job with definite career potential

____(7) Other (Please specify) ____________

7. How did you find your job? (Please check one)

____(1) Employed at job while completing my program

____(2) School placement officer or instructor

____(3) Professional periodicals or organizations

____(4) Civil Service application

____(5) Public or private employment agency

____(6) Newspaper advertisement

____(7) Direct application to employer

____(8) Friends or relatives

____(9) Other (Please specify) ____________

8. Is your job related to your major field of study (your program)?

____(1) Directly related

____(2) Somewhat related

____(3) Not related at all

(NOW GO TO QUESTION ___)

9. Are you currently seeking or planning to seek (within 6 months) a full-time job (35 hours or more a week)?

____(1) Yes (GO TO QUESTION 10)

____(2) No (SKIP TO QUESTION __)

10. In what kind of business or industry is the job you are (or will be) seeking? (For example, accounting firm, public school, TV manufacturer)

____

11. What kind of work do you expect to do on the job you are (or will be) seeking? (For example, accounting, teaching, electrical engineering, welding)

____

Procedure for a FORMER-STUDENT Questionnaire

1. When you left (Name of Institution) were you employed in or had you secured a full-time job (35 hours or more a week)?

   ____(1) Yes (SKIP TO QUESTION __)

   ____(2) No (GO TO QUESTION 2)

2. Were you seeking or planning to seek (within 6 months) a full-time job after leaving (Name of Institution)?

   ____(1) Yes (TO TO QUESTION 10)

   ____(2) No (SKIP TO QUESTION __)

3. How long did it take you to find your first full-time job?

   ____(1) Less than a month

   ____(2) 1 - 2 months

   ____(3) 3 - 4 months

   ____(4) 5 - 6 months

   ____(5) more than 6 months

   ____(6) I still haven't found one

4. What was (or is) the name and address of your first full-time employer? (Name of employing firm.)

   ____

   City__________ State________ Zip_____

5. What kind of business or industry was (or is) your first job in? (For example, accounting firm, public school, TV manufacturer)

   ____

6. What kind of work did (or does) your first job involve? (For example, accounting, teaching, electrical engineering, welding)

   ____

7. In your first full-time job after leaving (Name of Institution), were you (or are you):

   ____(1) An employee of a private business?

   ____(2) Self-employed in your own business?

   ____(3) An employee of local, state, or federal government?

   ____(4) A public employee of a nongovernmental organization? (For example, an environmental agency, a public school system)

8. Which statement best describes how you regarded (or regard) this first job? (Please check one)

   ____(1) Temporary job until a better one could be found.

   ____(2) Temporary job while waiting to report to a new job.

   ____(3) Temporary job to earn money to do something else (travel, school, have free time, etc.).

   ____(4) Job to earn money while I decided what kind of work I wanted.

   ____(5) Job with possible career potential.

   ____(6) Job with definite career potential.

   ____(7) Other (Please specify)____________

9. How did you find your first job? (Please check one)

   ____(1) Employed at job while completing my program

   ____(2) School placement officer or instructor

   ____(3) Professional periodicals or organizations

   ____(4) Civil Service application

   ____(5) Public or private employment agency

   ____(6) Newspaper advertisement

   ____(7) Direct application to employer

   ____(8) Friends or relatives

   ____(9) Other (Please specify)____________

10. Was (or is) your first full-time job related to your major field of study (your program)?

    ____(1) Directly related

    ____(2) Somewhat related

    ____(3) Not related at all

The open-end questionnaire items in the procedures above have been used by the U.S. Bureau of Census to determine the employment sector and the kind of work in which a person is involved. They have been suggested here since they have the advantage of allowing the respondent to provide his or her own answer and obtaining responses that can be compared to the data the Bureau of Census collects in its annual educational attainment survey, which is conducted each March. (See U.S. Bureau of Census, Current Population Reports: Series P-20, "Educational Attainment in the United States." However, the open-end items have the disadvantage of requiring the data processor either to code the responses using the Bureau of Census' categories, which are quite detailed, or to develop his or her own categories for coding purposes.

As an alternative, the following closed-end questionnaire items are suggested as possible replacements for items 3, 4, and 5 in the EXITING STUDENT Questionnaire procedure and items 5, 6, and 7 in the FORMER-STUDENT Questionnaire procedure.

1. In which of the following employment sectors is your full-time job? (Please check one)

		(✓)	
Government:	Federal	___	(01)
	State	___	(02)
	Local	___	(03)
Education:	Elementary and Secondary	___	(04)
	Higher Education	___	(05)
Other Nonprofit Organizations:	Hospitals, clinics	___	(06)
	Social Welfare	___	(07)
	Church	___	(08)
	Other nonprofit organizations . . .	___	(09)
Business and Service:	Self-employed or family business .	___	(10)
	Private Company	___	(11)
	Professional partnership	___	(12)
	Research	___	(13)
Other:	Please specify ____________________	___	(14)

2. From the list that appears on page ___, which entry best describes the full-time occupation in which you are (or will be) employed? (Please write its 3-digit code in the space below.)

Occupation: |__|__|__| ____

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D-2
MEASURE NUMBER

MEASURE NAME

Student success in obtaining preferred first job

DEFINITION

Number and percentage of students who received the job of their first choice upon leaving the institution

DATA SOURCES

Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Vocational Preparation (1.4.1.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-2

The procedure developed for the acquisition of data for outcome measure D-2 requires the use of a survey questionnaire. Because of the nature of the measure, the procedures are only appropriate for use in a FORMER-STUDENT Questionnaire.

Procedure for a FORMER-STUDENT Questionnaire

It should be noted that questionnaire items 1 and 2 below are suggested since they are comparable to those used in the American Council on Education's longitudinal follow-up studies of college students. As a result, the results obtained from the use of these items can be compared to the ACE results referenced in Preventing College Dropouts (Astin, 1975) or by writing to Dr. Alexander Astin, Graduate School of Education, University of California at Los Angeles, California.

1. In your first full-time job after leaving [Name of Institution], which of the following was your first employer? (PLEASE CHECK ONE)

		First Employer
Government:	Federal	__(01)
	State & Local	__(02)
Education:	Elementary & Secondary	__(03)
	Higher Education.	__(04)
Other Nonprofit Organizations:	Hospitals, clinics.	__(05)
	Social welfare.	__(06)
	Church.	__(07)
	Other non-profit organizations. . .	__(08)
Business & Service:	Self-employed or family business. .	__(09)
	Private company	__(10)
	Professional partnership.	__(11)
	Research.	__(12)
Other:	(Please specify). . . . . ________________________	__(13)

2. How much of the work in this first full-time job was devoted to the following activities? (CHECK ONE FOR EACH ACTIVITY)

	(1) A Major Amount	(2) A Minor Amount	(3) None
A. Teaching	___	___	___
B. Research and Development	___	___	___
C. Administration or Management	___	___	___
D. Service to patients or clients	___	___	___
E. Other (Specify) ________________________	___	___	___

3. Was your first full-time job after leaving [Name of Institution] the job you most preferred at the time?

___(1) Yes

___(2) No

4. Which statement best describes how you regarded your first job? (PLEASE CHECK ONE)

___(1) Temporary job until a better one could be found.

___(2) Temporary job while waiting to report to a new job.

___(3) Temporary job to earn money to do something else (travel, school, have free time, etc.).

___(4) Job to earn money while I decide what kind of work I wanted.

___(5) Job with possible career potential.

___(6) Job with definite career potential.

___(7) Other (Please specify) _________

5. How did you find your first job after leaving [Name of Institution]? (PLEASE CHECK ONE)

___(1) Employed at job while completing my program.

___(2) School placement officer or instructor.

___(3) Professional periodicals or organizations.

___(4) Civil Service application

___(5) Public or private employment agency.

___(6) Newspaper advertisement.

___(7) Direct application to employer.

___(8) Friends or relatives.

___(9) Other (Please specify)___________

6. Was your first job related to your major field of study (your program)?

___(1) Directly related

___(2) Somewhat related

___(3) Not related at all

As an alternative to questionnaire items 1 and 2 above, one may wish to consider the following three questions which have been used by the U.S. Bureau of Census to determine the employment sector and kind of work a person is doing or has done. Responses to these questions and those pertaining to questions 4, 5, and 6 above can be compared to data the Bureau of Census collects in its annual educational attainment survey which is conducted each March. (See U.S. Bureau of Census Current Population Reports: Series P-20, "Educational Attainment in the United States.")

1. In what kind of business or industry was (or is) your first full-time job after leaving [Name of Institution]? (For example, accounting firm, public school, TV manufacturer)

   ____ ☐☐☐

2. What kind of work did (or does) your first full-time job involve? (For example, accounting, teaching chemistry, electrical engineering)

   ____ ☐☐☐

3. In your first job were you (or are you):

   ____(1) An employee of a private business?

   ____(2) Self-employed in your own business?

   ____(3) An employee in local, state, or federal government?

   ____(4) A public employee in a nongovernment organization? (For example, an environmental agency, a public school system, a public hospital)

Another alternative for questionnaire items 1 and 2 above is the following:

1. From the list that appears on page __, which entry best describes your first full-time occupation after leaving [Name of Institution]? (Please write its 3-digit code in the space below.)

   Occupation: |_|_|_| ____________________________________

D-3
MEASURE NUMBER

EASURE NAME

Occupational Career Choice

EFINITION

Number and percentage of students choosing a particular occupational career (that is, their employment goals)

ATA SOURCES

Current Students, Exiting Students, Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Vocational Aspirations (1.4.2.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-3

The procedures developed for obtaining data for outcome measure D-3 call for the use of a survey questionnaire. Two alternative sets of questionnaire items have been developed for use in a survey of current students, exiting students, or former students (graduates and nongraduates).

Procedures for a CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

Two alternative sets of questionnaire items are presented for inclusion in a CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire. Alternative #1 can be used if one is interested in knowing about the respondent's long-run career employer and the specific *job position* the respondent hopes to enter in his or her *long-run occupational career*. Alternative #2 can be useful if one is interested in knowing the respondent's intentions regarding his or her *long-run career employer* and the *job activities* the respondent intends to engage in during his or her long-run career. An advantage of the second alternative set of items is that they are compatible with those used in the American Council on Education's longitudinal follow-up studies on college students. As a result, the results obtained from the use of these items can be compared to the ACE results referenced in *Preventing College Dropouts* (Astin, 1975) or by writing to Dr. Alexander Astin, Graduate School of Education, University of California at Los Angeles, California.

Alternative #1

1. We would like to find out about your long-run occupational career goals.

a. Over the long-run, in which employment sector are you primarily interested in working? (PLEASE CHECK ONE)

		Long-run Career Employer
Government:	Federal	__ (01)
	State	__ (02)
	Local	__ (03)
Education:	Elementary and Secondary	__ (04)
	Higher Education	__ (05)
Other Nonprofit Organizations:	Hospitals, clinics	__ (06)
	Social Welfare	__ (07)
	Church	__ (08)
	Other nonprofit organizations . . .	__ (09)
Business and Service:	Self-employed or family business .	__ (10)
	Private Company	__ (11)
	Professional partnership	__ (12)
	Research	__ (13)
Other:	Please specify ________________ ________________________________	__ (14)

b. From the list that appears on page __, which entry best describes your expected long-run career work? (Please write its 3-digit code in the space below.)

Long-run Occupational Career: |_|_|_|

____

c. How sure are you of your choice in "b"?

____(1) Quite sure

____(2) Somewhat sure

____(3) Not sure

Alternative #2

1. We would like to find out about your long-run occupational career goals and activities:

a. In the long-run, whom do you expect will be your career employer? (PLEASE CHECK ONE)

		Long-run Career Employer	
Government:	Federal	__	(01)
	State	__	(02)
	Local	__	(03)
Education:	Elementary and Secondary	__	(04)
	Higher Education	__	(05)
Other Nonprofit Organizations:	Hospitals, clinics	__	(06)
	Social Welfare	__	(07)
	Church	__	(08)
	Other nonprofit organizations.. . .	__	(09)
Business and Service:	Self-employed or family business .	__	(10)
	Private Company	__	(11)
	Professional partnership	__	(12)
	Research	__	(13)
Other:	Please specify ________________ ________________________	__	(14)

b. How much of your long-run career work do you expect will be devoted to each of the following job activities? (Please check one for each activity.)

Job Activities	Long-run Career Work (1) A Major Amount	(2) A Minor Amount	(3) None
A. Teaching	___	___	___
B. Research and Development	___	___	___
C. Administration or Management	___	___	___
D. Service to customers, patients, or clients	___	___	___
E. Other (Specify) __________ ____________________	___	___	___

D-4	MEASURE NUMBER

EASURE NAME Job Satisfaction

EFINITION

The general satisfaction of former students with their job experiences

DATA SOURCES

Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Vocational Preparation (1.4.1.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-4

The procedure presented for determining job satisfaction involves the use of a survey questionnaire. Interest in job satisfaction as an outcome measure could relate to a former student's satisfaction with his or her first job or with his or her current job. As a result, questionnaire items have been developed to serve both purposes. Whether both items would be used in the same questionnaire would depend on the purpose of the data collection effort.

Procedures for a FORMER-STUDENT Questionnaire

[SEE FOLLOWING PAGE]

Alternative #1: Satisfaction with first job.

1. In general, how well did you (or do you) like your first job after leaving [Name of Institution]?

    ____(1) I didn't (don't) like it.

    ____(2) I was (am) more or less neutral about it.

    ____(3) I liked (like) it.

    ____(4) I was (am) enthusiastic about it.

2. Which statement best describes how you regarded (or regard) this first job? (PLEASE CHECK ONE)

    ____(1) Temporary job until a better one could be found.

    ____(2) Temporary job while waiting to report to a new job.

    ____(3) Temporary job to earn money to do something else (travel, school, have free time, etc.).

    ____(4) Job to earn money while I decided what kind of work I wanted.

    ____(5) Job with possible career potential.

    ____(6) Job with definite career potential.

    ____(7) Other (Please specify) ____________________________

3. Was (or is) your first full-time job related to your major field of study (your program)?

    ____(1) Directly related

    ____(2) Somewhat related

    ____(3) Not related at all

Alternative #2: Satisfaction with current job.

1. In general, how well do you like your current job?

____(1) I don't like it.

____(2) I am more or less neutral about it.

____(3) I like it.

____(4) I am enthusiastic about it.

2. Which statement best describes how you regard this job at this time? (PLEASE CHECK ONE)

____(1) Temporary job until a better one can be found.

____(2) Temporary job while waiting to report to a new job.

____(3) Temporary job to earn money to do something else (travel, school, have free time, etc.).

____(4) Job to earn money while I decide what kind of work I want.

____(5) Job with possible career potential.

____(6) Job with definite career potential.

____(7) Other (Please specify) ______________________________

3. Is your job related to your major field of study (your program)?

____(1) Directly related

____(2) Somewhat related

____(3) Not related at all

D-5
MEASURE NUMBER

EASURE NAME First job earnings

DEFINITION

Level of earnings of exiting and former students on their first full-time job (35 hours or more a week) after leaving school

DATA SOURCES

Exiting Students, Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Vocational Preparation (1.4.1.02) in the NCHEMS Inventory of Higher Educational Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-5

Two alternative procedures are suggested for identifying the level of earnings of exiting or former students on their first job after leaving the institution. Both require the use of a survey questionnaire.

The first alternative uses an open-end question to obtain the data needed to derive this measure. Its advantages include (1) a precise identification of the respondent's actual earnings on his or her first job, and (2) data that are very conducive to statistical analysis since they can easily be computed into a mean or median amount of earnings.

The second alternative incorporates a closed-end approach. The major advantage of this alternative is that categories are already available for quick and easy analysis.

Procedures for an EXITING-STUDENT or FORMER-STUDENT Questionnaire

[SEE FOLLOWING PAGE]

Alternative #1:

1. In your first full-time job (35 hours or more a week)) after leaving [Name of Institution], what is (or was) your gross salary or wage? (PLEASE FILL IN ONE)

$ ______________ (1) per year

$ ___________ (2) per week

$ ___________ (3) per hour

_______ (4) Don't know
(check)

Alternative #2:

1. In your first full-time job (35 hours or more a week) after leaving [Name of Institution], approximately what is (or was) the gross annual or weekly earnings associated with the job? (PLEASE CHECK ONE)

___(01) Less than $3,000 per year (less than $58 per week)

___(02) $3,000 - $5,999 per year ($58 - $114 per week)

___(03) $6,000 - $8,999 per year ($115 - $172 per week)

___(04) $9,000 - $11,999 per year ($173 - $230 per week)

___(05) $12,000 - $14,999 per year ($231 - $287 per week)

___(06) $15,000 - $17,999 per year ($288 - $345 per week)

___(07) $18,000 - $20,999 per year ($346 - $403 per week)

___(08) $21,000 - $23,999 per year ($404 - $461 per week)

___(09) $24,000 - $26,999 per year ($462 - $518 per week)

___(10) $27,000 - $29,999 per year ($519 - $576 per week)

___(11) $30,000 and over per year ($577 or more per week)

D-6
MEASURE NUMBER

MEASURE NAME Annual total income of former students

DEFINITION

Number and percentage of former students who are at a particular annual income level within a certain time period after leaving the institution

DATA SOURCES

Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Vocational Preparation (1.4.1.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-6

The procedure developed for obtaining data for outcome measure D-6, Annual Total Income of Former Students, calls for the use of a survey questionnaire. The three questionnaire items recommended for use in this procedure are designed to determine not only the respondent's annual salary, but also the total amount of dollars he or she has at his or her disposal at this time.

Procedure for a FORMER-STUDENT Questionnaire

[SEE FOLLOWING PAGE]

1. Approximately what is the annual salary or weekly wage you earn in your current job? (PLEASE CHECK ONE)

___(01) Less than $3,000 per year (less than $58 per week)
___(02) $3,000 - $5,999 per year ($58 - $114 per week)
___(03) $6,000 - $8,999 per year ($115 - $172 per week)
___(04) $9,000 - $11,999 per year ($173 - $230 per week)
___(05) $12,000 - $14,999 per year ($231 - $287 per week)
___(06) $15,000 - $17,999 per year ($288 - $345 per week)
___(07) $18,000 - $20,999 per year ($346 - $403 per week)
___(08) $21,000 - $23,999 per year ($404 - $461 per week)
___(09) $24,000 - $26,999 per year ($462 - $518 per week)
___(10) $27,000 - $29,999 per year ($519 - $576 per week)
___(11) $30,000 and over per year ($577 or more per week)

2. If you are married and your spouse is employed, what is the approximate annual salary or weekly wage your spouse earns in his or her current job? (PLEASE CHECK ONE)

___(01) Less than $3,000 per year (less than $58 per week)
___(02) $3,000 - $5,999 per year ($58 - $114 per week)
___(03) $6,000 - $8,999 per year ($115 - $172 per week)
___(04) $9,000 - $11,999 per year ($173 - $230 per week)
___(05) $12,000 - $14,999 per year ($231 - $287 per week)
___(06) $15,000 - $17,999 per year ($288 - $345 per week)
___(07) $18,000 - $20,999 per year ($346 - $403 per week)
___(08) $21,000 - $23,999 per year ($404 - $461 per week)
___(09) $24,000 - $26,999 per year ($462 - $518 per week)
___(10) $27,000 - $29,999 per year ($519 - $576 per week)
___(11) $30,000 and over per year ($577 or more per week)

3. What is your current estimated annual income from other sources as interest earned from savings accounts, profits from rental properties? (Please write in your estimate in the space below.)

Income from other sources = $__________/year

D-7
MEASURE NUMBER

EASURE NAME Employment in major field of study

EFINITION

Number and percentage of exiting or former students who are employed in a job related to their program of study

ATA SOURCES

Exiting Students, Former Students

ROCEDURES

Administration of a survey questionnaire

OMMENTS

This outcome measure is identified as a potential measure of Vocational Preparation (1.4.1.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-7

The procedures for obtaining data for outcome measure D-7 require the use of a survey questionnaire. The questionnaire items used to obtain the necessary data should be included in the section of an EXITING-STUDENT or FORMER-STUDENT Questionnaire that relates to occupational career information.

Procedure for an EXITING-STUDENT or FORMER-STUDENT Questionnaire

The following set of items assumes that a respondent has indicated he or she has a job.

1. Is your job related to your major field of study (your major program)?

____(1) Directly related

____(2) Somewhat related

____(3) Not related at all

2. How well do you feel your studies at [Name of Institution] prepared you for this job?

____(1) Excellent preparation

____(2) Good preparation

____(3) Fair preparation

____(4) Poor preparation

3. If you are employed outside your major field of study at [Name of Institution], why? (CHECK ALL THAT APPLY)

____(1) Never really planned to work in my major field

____(2) Tried but could not find a job in my major field

____(3) Did not feel I learned enough in my major field

____(4) Decided I did not like the work in my major field

____(5) Too little opportunity for advancement in my major field

____(6) Developed new career interest

____(7) Better job opportunity came along

____(8) Other (Please specify) ____________________

D-8
MEASURE NUMBER

EASURE NAME Change and Stability of Career Goals

DEFINITION

The number and percentage of former students who have maintained or changed their career goals between the time they left the institution and the present time

DATA SOURCES

Former Students

PROCEDURES

Administration of a survey questionnaire

COMMENTS

This outcome measure is identified as a potential measure of Vocational Aspirations (1.4.2.04) in NCHEMS Inventory of Higher Education Outcome Variables and Measures-- see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-8

The procedures developed for obtaining outcome measure D-8 require the use of a survey questionnaire. The questionnaire items presented below are intended to cope with the situation in which a user has no prior information about the respondent's occupational career choice at the time the respondent left the institution.

Procedures for a FORMER-STUDENT Qustionnaire

[SEE FOLLOWING PAGE]

1. The following items are intended to help us learn whether you have changed your "desired" long-run career employer and long-run career occupation since you left [Name of Institution].

a. PLEASE CHECK ONE IN EACH COLUMN:

		Desired *EMPLOYER* When You Left [Name of Institution]	Desired *EMPLOYER* At This Time
Government:	Federal	____(01) . .	____(01)
	State	____(02) . .	____(02)
	Local	____(03)	____(03)
Education:	Elementary and Secondary.	____(04) . .	____(04)
	Postsecondary Education.	____(05) . .	____(05)
Other Nonprofit Organizations:	Hospitals, clinics. . . .	____(06) . .	____(06)
	Social Welfare	____(07) . .	____(07)
	Church	____(08) . .	____(08)
	Other nonprofit organizations.	____(09) . .	____(09)
	Self-employed or Family Business	____(10) . .	____(10)
	Private Company	____(11) . .	____(11)
	Professional Partnership.	____(12) . .	____(12)
	Research.	____(13) . .	____(13)
	(Please specify) ________ ________________________	____(14) . .	____(14

b. From the list that appears on page __, please write in the 3-digit code of the entry that applies to each of the following two questions:

(1) What was your desired long-run career occupation when you left [Name of Institution]? |__|__|__|

(2) What is your desired long-run career occupation at this time? |__|__|__|

E. Student Personal Development

(No outcome measures and data acquisition procedures are presented in this category in this version of the *Manual*.)

F. Student Social/Cultural Development

(No outcome measures and data acquisition procedures are presented in this category in this version of the _Manual_.)

SECTION III

NEW KNOWLEDGE AND ART FORMS
MEASURES AND PROCEDURES

The outcome data acquisition procedures presented in this section are intended to obtain selected outcome measures that potentially reflect the results and impacts of postsecondary institutions and their programs in two broad areas: the development of new knowledge and the development of new art forms.

G. Development of New Knowledge

G-1 Research proposals funded
G-2 Research restricted revenues

H. Development of New Art Forms

(No measures and procedures are presented in this category in this version of the Manual.)

The extremely limited size of this set of outcome measures reflects the fact that our understanding of the nature and attributes of outcomes in this area is less thoroughly developed than for any other categories of outcomes. The long-term nature of many new knowledge and art forms outcomes combines with the diversity of the recipients to which they accrue to make the question of measurement more complex than for any other type of outcomes. It is hoped tha developmental work currently underway at NCHEMS and elsewhere will contribute to understanding in this area.

In keeping with the emphasis on operational feasibility that pervades this edition of the manual, only a few measures were selected for inclusion at this time. These measures clearly are not meant to reflect the full range of new knowledge and art forms measures. They are, however, considered to be useful proxies and were endorsed by the respondents to the NCHEMS Higher Education Outcome Measures Identification Study. Later editions of the manual will include a significantly expanded set of new knowledge and art forms measures and procedures. In fact, the present measures serve as "pointers" toward this further development in addition to representing useful information items in their own right.

G. Development of New Knowledge

- G-1 Research proposals funded
- G-2 Research restricted revenues

G-1
MEASURE NUMBER

MEASURE NAME Research proposals funded

DEFINITION

Number and percentage of research proposals that were funded within a certain time period, by PCS subprogram, annual level of funding and duration of funding

DATA SOURCES

Institutional Research Contracts Officer or Faculty/Staff

PROCEDURES

Search of institutional records

COMMENTS

This outcome measure is identified as a potential proxy measure of Discovery of New Knowledge (2.0.0.01) and Interpretation and Application of New Knowledge (2.0.0.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE G-1

The procedural steps recommended for obtaining data for outcome measure G-1 require the use of institutional records that contain information about research proposals that have been acted upon and funded by various funding sources. A proposal is defined as acted upon once it has been submitted to a funding organization and the funder has made a decision to fund or not fund the proposal. Normally, this information can be collected from an institution's office for grants and contracts. If such an office doesn't exist, a survey of the heads of academic departments and research centers in the institution will need to be conducted to obtain the data necessary for deriving this measure. Once the appropriate data source is determined, the following steps can be implemented:

1. Specify the time period for which the measure will be derived (for example, fiscal year).
2. For each organizational unit within subprograms 2.1--Institutes and Research Centers and 2.2--Individual or Project Research of the NCHEMS revised Program Classification Structure (PCS), identify the number of research proposals that have been acted upon by funders in the specified time period.
3. For each proposal that was acted upon identify:
    a. The requested level of total funding.
    b. The requested duration of funding using the following categories:

        (1) less than 1 year

        (2) 1-3 years

        (3) More than 3 years

    c. Whether or not the proposal was funded.

4. For each acted upon proposal that was funded identify:

    a. The actual level of funding;

    b. The actual duration of funding.

5. Data should now be available for determining the number of proposals funded as a percentage of proposals acted upon, by PCS 2.0 sub-program categories, level of funding, and duration of funding.

G-2
MEASURE NUMBER

EASURE NAME Research restricted revenues

EFINITION

Total research restricted revenues as a percentage of the total budget, by PCS program activity center and by source of revenues

DATA SOURCES

Institutional Budget Officer

PROCEDURES

Search of institutional records

COMMENTS

This outcome measure is identified as a potential proxy measure of Discovery of New Knowledge (2.0.0.01) and Interpretation and Application of New Knowledge (2.0.0.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE G-2

The procedural steps recommended for obtaining data for outcome measure G-2 call for the use of institutional records concerning revenues received by the research program activity centers in the institution. The data necessary for deriving this measure should be available in the institution's business office or in the office for grants and contracts.

The following steps are used for deriving data for measure G-2:

1. Specify the time period for which the measure will be derived (for example, the academic year).
2. For each organizational unit within subprograms 2.1--Institutes and Research Centers and 2.2--Individual or Project Research of the NCHEMS revised Program Classification Structure, identify the total restricted current fund revenues expended from the following source categories:
    a. Governmental Grants and Contracts:
        (1) Federal
        (2) State
        (3) Local
    b. Private Gifts, Grants, and Contracts.

The following data display format can be used for organizing the revenue data:

2.0 RESEARCH PROGRAM CATEGORIES	SOURCE OF REVENUES (Restricted)				
	Government Grants & Contracts			Private Gifts, Grants & Contracts	Total
	Federal	State	Local		
2.1 Institutes & Research Centers					
2.1.0100					
2.1.0200 NOTE: Refer to Appendix E for a complete listing of the HEGIS disciplines.					
.					
.					
.					
2.1.5500					
2.1.9200					
2.2 Individual or Project Research					
2.2.0100					
2.2.0200 NOTE: Refer to Appendix E for a complete listing of the HEGIS disciplines.					
.					
.					
.					
2.2.5500					
2.2.9200					

3. Identify total budget for each organizational unit in subprograms 2.1 and 2.2 of the PCS.

4. Once step 3 is completed, the total restricted revenues expended as a percentage of the total budget for the designated time period can be calculated for each organizational unit associated with 2.1 and 2.2 of the PCS.

H. Development of New Art Forms

(No outcome measures and data acquisition procedures are presented in this category in this version of the Manual.)

SECTION IV

COMMUNITY IMPACT
MEASURES AND PROCEDURES

The outcome data acquisition procedures presented in this section are intended to obtain data for selected outcome measures that potentially reflect the impacts of a postsecondary institution and its program on the local community. The data acquisition procedures included in this section are presented for the following outcome measures, which have been grouped into three subcategories:

I. Community Impact: Education

- I-1 Enrollment of non-degree/diploma/certificate students
- I-2 Community participation in community education programs
- I-3 Community participation in extension services
- I-4 Educational goals achieved by community participants

J. Community Impact: Service

- J-1 Institution's participation in community affairs
- J-2 Community participation in an institution's social, cultural, and recreational programs
- J-3 Community use of institutional facilities

K. Community Impact: Economic

- K-1 Institution's payment of local taxes and state taxes and tax compensation
- K-2 Institution's purchase of locally provided utilities
- K-3 Institution's purchase of locally delivered goods and services
- K-4 Institution's capital equipment expenditure relevant to the local community
- K-5 Institution's capital construction expenditure relevant to the local community
- K-6 Local expenditures by faculty and staff
- K-7 Local expenditures by students
- K-8 Local expenditures by visitors

The information generated from the outcome data acquisition procedures presented in this section should be helpful in identifying what impact or consequences an institution has had on a community in terms of community education, social and cultural services, and economic activities. They also should help institutions assess how meaningful and effective their programs are so that institutions can better fulfill their mission regarding the development of and service to the community.

The community impact measures in the manual focus on the local community. It is important to note, however, that the local community should not necessarily be restricted to the legal or jurisdictional boundary, but rather should be defined as the functional local community in which the impact of an institution is directly and physically felt. Possible criteria for defining the functional local community would include:

1. The geographical area in which the majority of an institution's students, faculty, and staff reside;
2. The community in which an institution's major business transactions (purchase of goods and services) take place; and
3. The community in which an institution's direct public service activities (for example, agricultural extension service) are arranged to meet the needs of particular groups.

Since institutions vary widely from one another with respect to what precisely constitutes their functional or operational local community, it seems best to leave the task of defining the functional local community to each user. The user may wish to explore impacts using more than one of these definitions.

I. Community Impact: Education

I-1 Enrollment of non-degree/diploma/certificate students
I-2 Community participation in community education programs
I-3 Community participation in extension services
I-4 Educational goals achieved by community participants

I-1
MEASURE NUMBER

MEASURE NAME

Enrollment of non-degree and non-certificate seeking students

DEFINITION

The number of persons, who are not seeking a degree or certificate (nonmatriculating students), enrolled in regular credit-producing instructional programs or courses, as defined by subprograms 1.1 and 1.2 in the NCHEMS Program Classification Structure (PCS)

DATA SOURCES

Institutional Student Records

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a proxy measure of an institution's contribution to Community Educational Development (3.1.0.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE I-1

The data acquisition procedures developed for outcome measure I-1 are relatively straightforward in the sense that they require a single headcount of "nonmatriculating" students, that is, of those students who are not working toward a degree or a certificate, who are enrolled in credit-producing programs or courses. The procedures suggest that the NCHEMS Program Classification Structure (Gulko, 1972 and Collier, 1975) be used to organize the different credit-producing programs in which the "nonmatriculating students" are enrolled.

Procedures for Use of Institutional Records

1. Determine the time period during which the number of non-degree and non-certificate seeking students enrolled in credit-producing instructional programs will be ascertained.
2. Examine the individual student files and identify all "nonmatriculating students."
3. For the students identified in 2 above, identify those who are enrolled in the PCS Instructional Subprograms:
   1.1--General Academic Instruction, and
   1.2--Occupational and Vocational Instruction.
4. Next identify the PCS Subprogram Categories in which they are enrolled, such as 1.1.0201--Environmental Design or 1.2.5007--Photography Technologies.
5. For a descriptive summary of the data, total the number of "nonmatriculating students" enrolled in each Subprogram Category of the PCS.

I-2

MEASURE NUMBER

MEASURE NAME

Community participation in community education programs

DEFINITION

The number of persons, who are not seeking a degree or certificate (non-matriculating students), enrolled in non-credit-producing instructional activities that are offered on or off campus

DATA SOURCES

Institutional Student Records

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a proxy measure of an institution's contribution to Community Educational Development (3.1.0.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE I-2

The procedures for obtaining data for outcome measure I-2 require a simple headcount of those persons enrolled in those non-credit-producing instructional activities as defined by Subprogram 1.3--Community Education in the revised Program Classification Structure (Collier, 1975). In the revised PCS, the definition of Subprogram 1.3--Community Education is defined as follows:

> Community Education--1.3 includes those instructional activities that are noncredit and are therefore not applicable towards a post-secondary degree or certificate. These instructional activities may be offered both on or off campus and may be taken by either matriculated students or members of the general community. Any work that produces credit toward the high school diploma should be included in 1.4--Preparatory and Adult Basic Education.

Examples of Community Education include:

- Avocational Education (wine testing, weaving, guitar, and so forth)
- Adult Education
- Professional Review Courses
- Refresher Courses

In the procedural steps that follow, a distinction is made between matriculating students who are enrolled in such activities and nonmatriculating students who are enrolled.

Procedures for Use of Institutional Records

1. Determine the time period during which the number of persons participating in non-credit-producing Community Education

instructional activities (as defined by Subprogram 1.3 in the NCHEMS revised Program Classification Structure) will be ascertained.

2. List all instructional activities that would be classified in the PCS Subprogram 1.3--Community Education during the time period in focus.
3. Examine the individual student files and identify the matriculating students who have enrolled in each Community Education activity identified in 2 above, and then the nonmatriculating students who have enrolled in each of those activities.
4. The data should now be organized for outcome measure I-2.

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I-3
MEASURE NUMBER

EASURE NAME Community participation in extension services

EFINITION

The number of persons from the community who have participated in cooperative extension service activities as defined by Subprogram 3.3 in the NCHEMS Program Classification Structure (PCS)

ATA SOURCES

Institutional records maintained in the office responsible for cooperative extension service activities

PROCEDURES

Search of institutional records

COMMENTS

This outcome measure is identified as a proxy measure of the extent to which the community receives direct assistance and services of various types from the primary programs of the institution. See Extension Services (3.2.0.01) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures, presented in Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE I-3

This outcome measure represents one indicator of the impact the institution and its programs have on the community. In developing the procedures for obtaining this measure, the following definition of Cooperative Extension Service, as defined by the NCHEMS Program Classification Structure (Gulko, 1972), was used:

> Cooperative Extension Service (subprogram 3.3) is established as a separate subprogram to accommodate the program elements that are established as the result of cooperative extension efforts between the institution and outside agencies, e.g., agriculture extension, urban extension. This subprogram is intended primarily for land-grant colleges and universities. The distinguishing feature of program elements in subprogram 3.3 is that the programmatic and fiscal control is shared by the institution with one or more governmental units. Historically, agriculture extension and increasingly certain urban extension programs represent a significant commitment of resources that are not necessarily under the control of the institution in terms of the programmatic direction of the activities. These cooperative extension programs are often a cross between independent operations and public service in that they represent a mix of resources belonging to the institution and resources under the control of an agency external to the institution.

Procedures for Use of Institutional Records

1. Identify the time period during which the number of community members participating in Cooperative Extension Service activities (PCS Subprogram 3.3) will be determined.
2. List all the Cooperative Extension Service programs that have been available to members of the general community during the period of time in focus.

3. Identify the number of participants in each program. (Do not include persons who participate in these programs for purposes of seeking credit toward a degree or certificate.)
4. For a descriptive summary of the data, list the total number of community participants for each cooperative extension service program offered during the period of time in focus.

I-4

MEASURE NUMBER

EASURE NAME

Educational goals achieved by community participants

DEFINITION

The degree of perceived personal improvement and satisfaction with respect to job promotion and salary increase, development of technical skills, leadership and human relations, and other personal attributes among community participants in institutional programs

DATA SOURCES

Persons in the community who have participated in specific educational programs on and/or off campus

PROCEDURES

Administration of a Survey Questionnaire

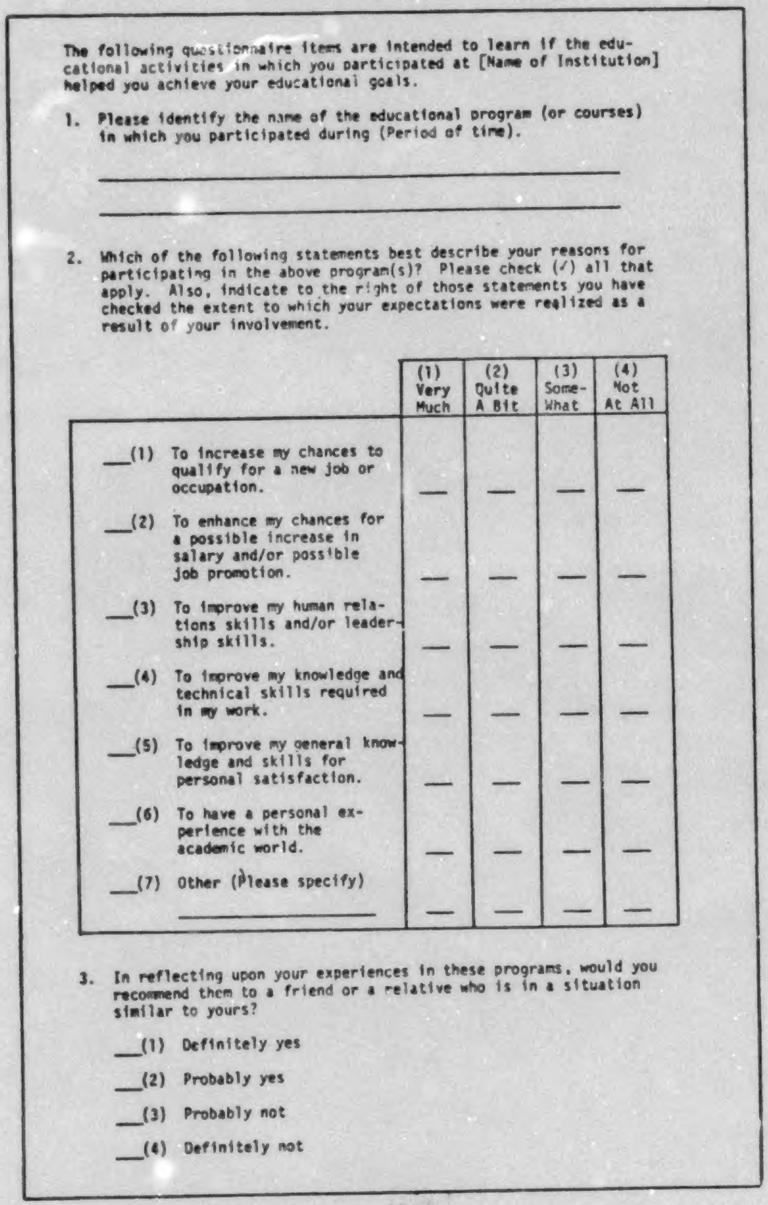
COMMENTS

This general outcome measure represents a counterpart to many of the Student Growth and Development Measures in Section II of this Manual. Instead of measuring the dimensions of student growth and development, however, the above outcome measure is aimed at measuring the growth and development of those persons who come into contact with the institution and its programs but are not seeking a degree or certificate.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE I-4

The procedure recommended for obtaining data for outcome measure I-4 requires the development and use of a survey questionnaire.

Procedures for a Questionnaire of Community Members Taking Courses



The following questionnaire items are intended to learn if the educational activities in which you participated at [Name of Institution] helped you achieve your educational goals.

1. Please identify the name of the educational program (or courses) in which you participated during (Period of time).

____

____

2. Which of the following statements best describe your reasons for participating in the above program(s)? Please check (✓) all that apply. Also, indicate to the right of those statements you have checked the extent to which your expectations were realized as a result of your involvement.

	(1) Very Much	(2) Quite A Bit	(3) Some-What	(4) Not At All
___(1) To increase my chances to qualify for a new job or occupation.	___	___	___	___
___(2) To enhance my chances for a possible increase in salary and/or possible job promotion.	___	___	___	___
___(3) To improve my human relations skills and/or leadership skills.	___	___	___	___
___(4) To improve my knowledge and technical skills required in my work.	___	___	___	___
___(5) To improve my general knowledge and skills for personal satisfaction.	___	___	___	___
___(6) To have a personal experience with the academic world.	___	___	___	___
___(7) Other (Please specify) ______________	___	___	___	___

3. In reflecting upon your experiences in these programs, would you recommend them to a friend or a relative who is in a situation similar to yours?

___(1) Definitely yes

___(2) Probably yes

___(3) Probably not

___(4) Definitely not

J. Community Impact: Service

J-1 Institution's participation in community affairs
J-2 Community participation in an institution's social, cultural, and recreational programs
J-3 Community use of institutional facilities

J-1

MEASURE NUMBER

EASURE NAME Institution's participation in community affairs

EFINITION

The number of faculty, staff, and students who participate in various types of off-campus activities in the community, such as workshops, consulting, or giving lectures.

DATA SOURCES

Heads of departments or organizational units in the institution, faculty, current students

PROCEDURES

Administration of a Survey Questionnaire

COMMENTS

This outcome measure is identified as a proxy measure of an institution's contribution to the community through services provided by the faculty, staff, and students to various community groups and organizations. See outcome variable Extension Services (3.2.0.01), Personal Services (3.2.0.02), and Extramural Cultural and Recreational Services (3.2.0.03) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE J-1

Two alternative procedures are suggested for obtaining data about the extent to which persons in the institution (faculty, staff, and students) participate in various kinds of community activities. The first procedure attempts to identify the extent of participation in community activities by faculty, staff, and/or students as a result of an institutional assignment.

The second alternative for obtaining data for outcome measure J-1 involves the administration of a faculty activity analysis survey. Both procedures, as presented here, have major limitations. The major deficiency of the first procedure is that it does not identify those community activities in which faculty, staff, and students participate on a voluntary basis. The major limitation of the faculty activity analysis procedure is that it is restricted to faculty activities.

Procedures for a FACULTY, STAFF, and STUDENT COMMUNITY ACTIVITY SURVEY Questionnaire

[SEE FOLLOWING PAGE]

INSTRUCTIONS: The following questionnaire items are to determine the extent to which persons associated with your department or organizational unit have participated in various community activities (e.g., consulting, art performance, lectures or seminars for the public, internships, work study, and policy development) during [Period of Time].

1. Your name:____

2. The name of your department or organizational unit:

____

3. Has your department or organizational unit assigned, sponsored, or co-sponsored the participation of any of your faculty, staff, and/or students in community activities during [Period of Time]?

____(1) Yes (GO TO QUESTION 4)

____(2) No (SKIP TO QUESTION __)

4. Please identify in the spaces below: (1) the name of the activities or events in which these individuals have participated and (2) estimate the number of faculty, staff, and/or students who participated in each.

Name or Description of Activity	Number of:		
	Faculty	Staff	Students
1.			
2.			
3.			
4.			
5.			
6.			

THANK YOU FOR YOUR ASSISTANCE

Procedures for a FACULTY ACTIVITY ANALYSIS Questionnaire

If this alternative is chosen, it is believed that the user will wish to identify faculty activity as it relates not only to community service activities, but also to teaching, scholarship, and internal service activities. Therefore, it is recommended that the user consider implementation of the Faculty Activity and Outcomes Analysis (FAOA) survey procedures which have been developed by NCHEMS (Manning and Romney, 1973). These procedures have been designed to collect activity data that should be useful for a variety of institutional planning, management, and evaluation functions.

In the FAOA survey instrument, Section D, Public Service Activities, is for those activities faculty engage in principally outside the institution. For example, the following activities would be included:

- consulting
- giving professional advice
- directing or participating in community training
- urban extension
- giving lectures or seminars for the general public
- patient care
- agricultural extension

For the users's information, a copy of the FAOA questionnaire follows. Section D of the questionnaire concerns faculty Public Service Activities.

FACULTY ACTIVITY AND OUTCOME SURVEY

Name____**Date**______**Academic Term**________

Please address any questions to____________________________________**Phone**________

Upon completion, please detach the form and send it to________________________________

Purpose of Survey

Use this space for describing the
purpose of the survey and how the
collected data will be used.

PLEASE READ THE INSTRUCTIONS ON PAGES 2 AND 5 BEFORE YOU COMPLETE THE FORM.

A sample form is included on pages 6 and 7.

GENERAL INSTRUCTIONS

This survey asks you to estimate the average hours per week that you spend this term engaged in different types of activity. It then asks you to estimate the percentage contribution of these hours to the outcomes of the institution. Please read the acivity definitions and examples for each activity as you complete the survey.

Before completing the form, you might find it helpful to make an initial estimate of the average number of hours you spend each week in this term engaged in professional activities. Making this estimate might help you divide your time into the remaining sections of the survey instrument.

SECTION A: TEACHING ACTIVITIES

A.1 Scheduled Teaching: All activities related to courses (degree and nondegree, credit and noncredit, day or evening) given in the current term. These activities would include:

- Meeting informally with course participants
- Supervising these courses
- Meeting scheduled classes
- Grading
- Reading student papers
- Supervising teaching assistants
- Tutoring
- Supervising independent study
- Giving remedial help to course participants
- Supervising laboratories
- Evaluating students
- Contacting guest lecturers
- Preparing lectures
- Preparing media

Instructions for Columns (a) through (j)

(a) Do not complete this column. This column will be used to assign a discipline code to each course.

(b) Enter the department, college, or other unit designation under which the course is taught.

(c) Enter the number or other designation for the course and section.

(d) Enter the number of students enrolled and code (R) if course material is remedial (below college level) or (E) if it is extension (principally directed toward nonmatriculated students).

(e) Enter the number of student credit hours given for course. In the case of variable credit, give the credit hour range.

(f) Enter the method of instruction as coded below. When multiple methods are used, list them in order of importance.

(g) Enter the scheduled contact hours/week.

(h) Enter the average hours/week of unscheduled contact with students in course.

(i) Enter the average hours/week spent in preparing and arranging the activities of the current course.

(j) Enter the total average hours/week [sum of columns (g), (h), and (1) in Section A.1].

Method of Instruction Column (f)

Code	Method	Definition
A	Lecture	Formal presentation—primarily one-way communication
B	Laboratory	Instructing, preparing, and supervising student investigations
C	Recitation/Discussion	Two-way communication of course materials
D	Seminar	Students carry the major responsibility for preparation
E	Independent Study	Students work independently with only minimal faculty direction
F	Tutorial	Students work one-to-one with the instructor
G	Programmed Instruction	Course contents presented through programed materials

A.2 Unscheduled Teaching: Teaching not associated with the specific courses listed in A.1. For example:

- Thesis committee participation
- Thesis advising
- Discussions with colleagues about teaching
- Guest lecturing in another faculty member's course
- Giving seminars within the institution

A.3 Academic Program Advising: Giving advice to students concerning course scheduling and academic programs. Not to be confused with counseling that is included in C.1.

A.4 Course and Curriculum Research and Development: Developing and preparing for future courses. For example:

- Preparing course outlines
- Developing book lists
- Evaluating courses
- Devising new instructional materials
- Revising existing materials
- Planning summer or intersession programs
- Developing department curriculum requirements
- Evaluating teaching effectiveness and planning changes

Level Codes Column (p)

Code	Description	Code	Description
A	Preparatory	E	Upper division and graduate
B	Lower division	F	Graduate
C	Upper division	G	Professional
D	Undergraduate	H	Other

NAME ______________________ I.D. OR SOCIAL SECURITY NO. ______________________

FOR INSTITUTIONAL USE

ADDITIONAL INFORMATION BLOCK									FISCAL REFERENCE BLOCK						
INSTITUTION	TERM	TENURE	YEARS AT INSTITUTION	YEARS IN RANK	PRINCIPAL DEPARTMENT	ADMINISTRATION RANK	FACULTY RANK	LENGTH OF APPOINTMENT	REF. COL.	FTE	ACCOUNT TITLE	UNIT	PCB CODE	ACCOUNT NUMBER	SALARY DOLLARS

INITIAL ESTIMATE OF YOUR OVERALL AVERAGE HOURS PER WEEK ☐

SECTION A: TEACHING ACTIVITIES										(j) AVERAGE HOURS PER WEEK	PERCENTAGE DISTRIBUTION TO INSTITUTIONAL OUTCOMES				
A.1 SCHEDULED TEACHING											(k)	(l)	(m)	(n)	(o)
			(d) SECTION				(g) + (h) + (i) = (j)								
(a) REGIS Do not write in this column	(b) DEPT. UNIT	(c) COURSE & SECTION #	Enrollment	Code R if Remedial E if Extension	(e) CREDIT HOURS	(f) METHOD OF INSTRUCTION	(g) FORMAL CONTACT HOURS	(h) OTHER CONTACT HOURS	(i) PREPARATION & ADMINISTRATION		STUDENT GROWTH AND DEVELOPMENT %	DEVELOPMENT OF NEW KNOWLEDGE AND ART FORMS %	COMMUNITY SERVICE AND DEVELOPMENT %	INSEPARABLE COMBINATION OF (k) + (l) + (m) %	FISCAL REFERENCE DO NOT WRITE IN THIS COLUMN
					SUBTOTAL										

Tear Here

	(p) LEVEL	(q) ACTIVITY DESCRIPTION						
A.2 UNSCHEDULED TEACHING								
A.3 ACADEMIC PROGRAM ADVISING								
A.4 COURSE AND CURRICULUM RES. & DEVELOP								
		SUBTOTAL						

OUTCOME DEFINITION

This section of the form allows you to indicate what outcomes your activities principally benefit. Please try to make a rough estimate of the percentage distribution for each of your actvities to the followng outcomes:

(k) Student Growth and Development: Results and benefits of activities that contribute to enhancing personal, social, academic and/or career aspects of students who are registered in the institution.

(l) Development of New Knowledge and Art Forms: Results and benefits of activities that contribute to the development, storage, utilization, and/or appreciation of knowledge and art in society.

(m) Community Service and Development: Results and benefits of activities that contribute to educational growth in and provide short- or long-term utility to the non-academic community.

(n) Inseparable Combination of (k) + (l) + (m): Results and benefits of activities that contribute to student growth and development, creation of new knowledge and art forms, and community service and development and cannot be separated. (It is preferable to separate these if possible.)

COLUMN (O)

(o) Do not complete this column. This column will be used to link account codes to reported activities.

		(g)	(i)	PERCENTAGE DISTRIBUTION TO INSTITUTIONAL OUTCOMES				
	ACTIVITY	ACTIVITY DESCRIPTION	AVERAGE HOURS PER WEEK	(k) STUDENT GROWTH AND DEVELOPMENT %	(l) DEVELOPMENT OF NEW KNOWLEDGE AND ART FORMS %	(m) COMMUNITY SERVICE AND DEVELOPMENT %	(n) INSEPARABLE COMBINATION OF (j), (k) + (l) %	(o) FISCAL REFERENCE DO NOT WRITE IN THIS COLUMN
SECTION B: RESEARCH, SCHOLARSHIP & CREATIVE WORK ACTIVITIES	B.1 SPECIFIC PROJECTS							
	B.2 GENERAL SCHOLARSHIP AND PROFESSIONAL DEVELOPMENT							

SUBTOTAL	

SECTION C: INTERNAL SERVICE ACTIVITIES	C.1 STUDENT-ORIENTED SERVICE								
		CODE LEVEL							
	C.2 ADMINISTRATIVE DUTIES								
	C.3 COMMITTEE PARTICIPATION								

Tear Here

SUBTOTAL	

SECTION D: PUBLIC SERVICE ACTIVITIES	GENERAL PROFESSIONAL SERVICE ADVICE DIRECTED OUTSIDE THE INSTITUTION							

SUBTOTAL	

AVERAGE HRS/WEEK	

LEVEL OF ADMINISTRATIVE AND COMMITTEE ACTIVITIES

Code	Level
1	Department/Unit
2	College/School/Division
3	Campuswide

PLEASE READ THE INSTRUCTIONS ON THIS PAGE AS YOU COMPLETE THE FORM TO THE LEFT

SECTION B: RESEARCH, SCHOLARSHIP, AND CREATIVE WORK ACTIVITIES

B.1 Specific Projects: Research, scholarship, and creative work activity related to a specific project. For example:

- Departmental research
- Sponsored research
- Performing your professional skill
- Your dissertation research
- Revewing a colleague's research work
- Writing or developing research proposals
- Administering research grants
- Giving recitals
- Maintaining an artistic skill
- Writing articles
- Writing books
- Writing reviews
- Creating new art forms
- Exhibitions

B.2 General Scholarship and Professional Development: All research, scholarship, and creative work activities related to keeping current in a professional field. For example:

- Reading articles and books related to your profession
- Officer in a professional society
- Attending professional meetings
- Attending seminars
- Research-related discussion with colleagues
- Editor of a journal

SECTION C: INTERNAL SERVICE ACTIVITIES

This section includes activities related to general contact with students, to professional responsibilities within other organizational units within the institution, and to fulfilling institutonal requests.

C.1 Student-oriented Service: For example:

- Personal, career, and financial counseling
- Preparing recommendations
- Participation in social interaction
- Recruiting students
- Sponsoring student organizations
- Meeting with parents
- Attending student recitals
- Coaching intramural or intercollegiate athletics
- Directing the band, orchestra, student plays, debate team, or any other student group

C.2 Administrative Duties: For example:

- Performing the duties of a department chairman, dean, vice-president or any other administrative position
- Administering personnel policies
- Faculty service reports and questionnaires
- Keeping records
- Preparing minutes
- Writing and answering memoranda
- Assigning faculty course loads
- Preparing budgets
- Gathering data
- Helping during registration
- Interviewing candidates for faculty positions
- Escorting visitors
- Recruiting faculty
- Advising on library purchases
- Recruiting students

C.3 Committee Participation. For example:

- Admission committees
- Departmental meetings
- Faculty senate
- Planning committees
- Budget committees

Code the level of these activities as described at the foot of the form.

SECTION D: PUBLIC SERVICE ACTIVITIES

This section includes activities that are directed outside the institution [except for those associated with community education (extension instruction), which should be included in A.1.].

General Professional Services/Advice Directed Outside the Institution: Activities meant to benefit the community outside the institution. For example:

- Consulting
- Advising
- Professionally performing as in plays, orchestras
- Community training grants
- Patient care
- Lectures or seminars for the public
- Agricultural extension
- Urban extension

J-2	
MEASURE NUMBER	

MEASURE NAME Community participation in an institution's social, cultural, and recreational programs

DEFINITION

The number of persons from the community who participate in social, cultural, and recreational activities organized and sponsored by an institution for its members and the general public during a specified period of time

DATA SOURCES

Institutional records maintained by institutional departments or agencies sponsoring social, cultural, and recreational programs in which persons in the community participate

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a proxy measure of an institution's contribution to a community in the form of Extramural Cultural and Recreational Services which is Outcome Variable 3.2.0.03 in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE J-2

Data on public participation in the institution's social, cultural, and recreational activities can best be obtained by examining the records of the sponsors of such activities within the institution. For example, the offices of student government or student activities often maintain such records. The following procedural steps are suggested.

Procedures for Use of Institutional Records

1. Identify the time period during which the extent of public participation in the institution's social, cultural, and recreational activities will be determined.
2. Determine all the sponsors within the institution that have sponsored one or more social, cultural, and/or recreational activities within the designated period of time.
3. Ask each sponsor to:
    a. Identify the type of activity (ies) offered (social, cultural, or recreational).
    b. Estimate the number of community members who participated in each type of activity.
4. For a descriptive summary of the data, list the estimated number of community participants in each type of activity sponsored during the time period in focus.

J-3
MEASURE NUMBER

MEASURE NAME

Community use of institutional facilities

DEFINITION

The number of persons from the community utilizing facilities maintained by the institution such as libraries, language labs, testing centers, computer centers, health services, recreation and athletic facilities, museums, and so forth

DATA SOURCES

Managers of the Institutional Facilities, Members of the Community

PROCEDURES

Search of institutional records or administration of a questionnaire to members of the community

COMMENTS

This outcome measure is identified as a proxy measure of the extent to which individuals in the community receive various types of personal services from the support programs and facilities of the institution. See Personal Services (3.2.0.02) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures in Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE J-3

The extent to which community members use the educational or support facilities in an institution can be determined either by a questionnaire survey of a sample of the community population or by a survey of those persons in the community. As a result, two alternative procedures have been developed for obtaining data for this measure.

Procedures for a Facility Use Questionnaire Survey

Alternative #1--Survey of Facility Managers:

1. Select the time period during which the number of persons from the community using the institution's educational and support facilities will be determined.
2. List the facilities that are to be included in the study.
3. Identify the persons in charge of each facility (or who are in the best position to provide the information that is needed).
4. Administer the following "Facility Use Questionnaire" to each of the persons identified in 3 above. If a person is responsible for more than one facility, that person should complete a separate questionnaire for each facility.

Alternative #2--Survey of Community Members:

The following questionnaire item is designed to obtain self-reports from persons in the community to two questions concerning facility use:
(1) Do persons in the community know about certain institutional facilities

FACILITY USE QUESTIONNAIRE

The purpose of this short questionnaire is to help us determine the extent to which persons from the community make use of the facilities maintained by [Name of Institution]. Your cooperation in completing the questionnaire is most appreciated. Please return it to [Location] by [Date].

1. Your Name:__________________________________ 2. Date:______________

3. Address:____

4. Telephone Number:____

5. Please fill in the following table by estimating, as best you can, the number of persons from the community who have used this facility or have attended certain events, activities, etc. held in the facility for which you are responsible during [Period of Time].

Official Name of Facility: ____

Name or Description of Events or Activities	Estimated Number of Community Attendees	Please give a brief description of how you made your estimate.

being available to them? and (2) How many of those persons have used the facility or attended or participated in events held in the facility? In using this item, it will be necessary to develop a *list of the individual facilities* (health centers, libraries, counseling-developmental centers, computer centers, gymnasiums, and so forth) to which persons will be asked to react in the survey. Also, it will be necessary to determine the *time period* in which the respondent will identify if he or she used the facility.

1. The purpose of this questionnaire item is to help us learn about the extent to which persons in the community "know about" and "make use of" various facilities at [Name of Institution]. For each facility listed in the left-hand column, please answer questions "A" and "B."

Name of Facility	Question "A" Check (✓) each box below if you were aware, prior to receiving this questionnaire, that the facility was open to the public.	Question "B" Check (✓) each box below if you have used or have attended or participated in an event at the facility during the last six months.
	___	___
	___	___
	___	___
	___	___
	___	___
	___	___
	___	___

NOTE: The time period in Question"B" can be changed based on the purpose of your study.

K. Community Impact: Economic

K-1	Institution's payment of local taxes and state taxes and tax compensation
K-2	Institution's purchase of locally provided utilities
K-3	Institution's purchase of locally delivered goods and services
K-4	Institution's capital equipment expenditure relevant to the local community
K-5	Institution's capital construction expenditure relevant to the local community
K-6	Local expenditures by faculty and staff
K-7	Local expenditures by students
K-8	Local expenditures by visitors

K-1
MEASURE NUMBER

MEASURE NAME Institution's payment of local and state taxes and tax compensations

DEFINITION

All local taxes and tax compensations (payment made in lieu of taxes) that an institution pays to local governments (e.g., city, county, state) including school districts, towns, cities, counties, and so forth

DATA SOURCES

Institutional Business Office

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of the institution's Financial Impact on the Community (3.2.0.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

Most educational institutions are free from local tax assessments except for an institution's commercial or related activities. However, exceptions do occur. For example, some institutions may enter an agreement with the local government to pay certain amounts in order to compensate for the eroded tax-base due to their presence in the community.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE K-1

The data for outcome measure K-1 can be obtained through a search of institutional records, generally maintained in the institution's business office.

Procedures for Use of Institutional Records

1. Identify the period of time during which data for the measure will be examined.
2. Contact the chief business officer in the institution and determine:
    a. If the institution paid any locally assessed taxes during the time period in focus. If so, the following table should be completed:

Type of Taxes Paid	Name of Local Governments To Which Taxes Were Paid	Amount Paid
Property Tax		
Sales Tax		
Income Tax		
Other (please specify)		
	TOTAL:	

b. If the institution paid or donated any amount of dollars to the local government(s) in lieu of taxes (for example, in compensation for the eroded tax base) during the time period in focus, the following table should be completed:

Type of Payments or Donations	Name of Local Governments To Which Payments or Donations Have Been Made	Amount Paid
	TOTAL:	

K-2
MEASURE NUMBER

MEASURE NAME Institution's purchase of locally provided utilities

DEFINITION

Total amount of dollars expended on utilities (such as gas, electricity, garbage collection, sewage treatment) which were purchased from the local community during a certain time period

DATA SOURCES

Institutional Business Office

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of the institution's Financial Impact on the Community (3.2.0.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE K-2

Most institutions pay standard rates for locally provided utilities and the payments generally are made by the business office. Therefore, cost data on utilities purchased from the local community should be obtainable by simply searching the institution's utility payment records.

Procedures for Use of Institutional Records

The following procedural steps are suggested for obtaining the total dollar figure for locally provided utilities:

1. Identify the time period during which the amount of dollars expended on locally provided utilities will be determined.
2. Determine the boundary of the institution's functional local community.
3. Identify the types of utilities that have been purchased from the defined local community.
4. Tabulate payment figures by using the following format:

Type of Utility	Name and address of the businesses in the local community from which utilities have been purchased	Amount of Dollars
	TOTAL:	

K-3

MEASURE NUMBER

MEASURE NAME

Institution's purchase of locally delivered goods and services

DEFINITION

Total amount of dollars expended on goods and services that are purchased by the institution from the local community during a certain time period. Goods and services are distinguished from capital equipments generally defined by each institution in terms of dollars and duration (see COMMENTS). Also, goods and services, as referred to here, do not include utilities purchased from the local community (see Outcome Measure K-2)

DATA SOURCES

Institutional Business Office

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of an institution's Financial Impact on the Community (3.2.0.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

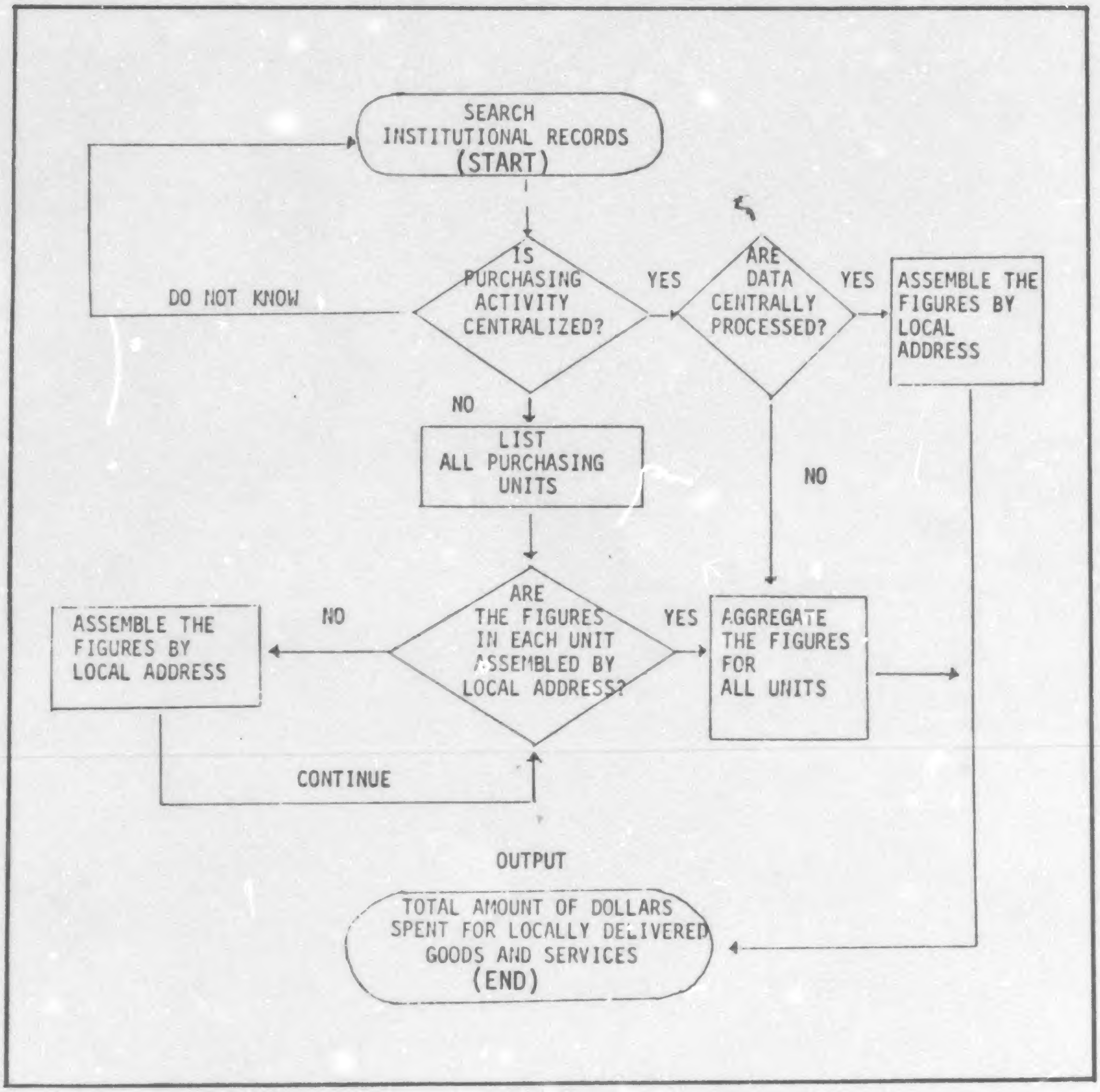
In separating "goods and services" from "capital equipment" each institution uses different criteria of dollars and duration. The user of the manual should consult the institution's business office to determine the criteria for distinguishing goods and services from capital equipment.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE K-3

Considering the potential diversity in purchasing methods and record keeping among institutions, it is expected that users of the manual will have to make several decisions during the course of gathering the data for this measure. For the purpose of clarifying the process of searching institutional records to obtain the desired information, a simple flow chart is presented in Figure K-3.1 on the next page. The user may consult the information search process suggested in the figure and make a general plan applicable to his or her particular situation prior to engaging in the data collection activity.

Figure K-3.1

INFORMATION SEARCH PROCESS FOR OUTCOME MEASURE K-3


SEARCH INSTITUTIONAL RECORDS (START)
IS PURCHASING ACTIVITY CENTRALIZED?
DO NOT KNOW
YES
NO
ARE DATA CENTRALLY PROCESSED?
YES
NO
ASSEMBLE THE FIGURES BY LOCAL ADDRESS
LIST ALL PURCHASING UNITS
ARE THE FIGURES IN EACH UNIT ASSEMBLED BY LOCAL ADDRESS?
NO
YES
ASSEMBLE THE FIGURES BY LOCAL ADDRESS
AGGREGATE THE FIGURES FOR ALL UNITS
CONTINUE
OUTPUT
TOTAL AMOUNT OF DOLLARS SPENT FOR LOCALLY DELIVERED GOODS AND SERVICES (END)

Procedures for Use of Institutional Records

1. Identify the time period during which the total amount of dollars expended on goods and services that are purchased by the institution from the local community are to be determined.
2. Determine the boundary of the institution's functional local community.
3. Consult the institution's business office to determine whether the purchasing activity of the institution is carried out by a central purchasing office or by subunits (departments and other organizational units) within the institution.
4. If the purchasing activity is centralized, determine whether the purchasing records contain the addresses of the suppliers in the designated local community. If they do, it is simply a matter of retrieving the information according to the planned format. If, however, the record files do not contain the local supplier's addresses, the user of the manual will have to obtain such information from the existing files that contain the vendor register or invoice vouchers.

If, by chance, the user attempts to use an aggregate figure that already has been developed by certain offices, care should be taken about the reliability of that information. For example, the user might check the aggregate information against the original data or check the information generated by one office against that generated by another office.

5. If the purchasing activity is not centralized or the needed information is not centrally available, the following steps should be taken:
    a. Consult the institution's business office and identify all purchasing units within the institution.
    b. Contact the person in charge of each purchasing unit's expenditure records and obtain the needed information for deriving the measure.
6. Calculate the total amount of dollars paid by each purchasing unit in the institution to suppliers in the designated functional local community within the specified time period.

K-4
MEASURE NUMBER

MEASURE NAME

Institution's capital equipment expenditure relevant to the local community

DEFINITION

Total amount of dollars expended in the local community by institutions as a result of an institution's capital outlay expenditure. Capital outlay is usually defined in terms of a "good" with the cost exceeding (1) a certain amount of dollars and (2) the duration of useful life of the "good" years. The criteria may vary somewhat among institutions. (See COMMENTS)

DATA SOURCES

Institutional Business Office

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of an institution's Financial Impact on the Community (3.2.0.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

The user of this procedure is advised to follow the definition of "capital outlay" used by the institution. Although the criteria may vary somewhat among institutions, the margin of error will be much less significant than that stemming from imposing a new definition which would inevitably disrupt the standard operating procedure developed in each institution.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE K-4

In obtaining the data on the total amount of dollars expended in the local community by the institution for capital equipment, the user should consult the institution's business office and apply the same information search procedures as that developed for outcome measure K-3.

As pointed out earlier (see procedures for outcome measure K-3), "capital outlay" is distinguished from "goods and serivces" for expenditure analysis purposes. A conceptual distinction is therefore made in the definition of outcome measure K-4.

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K-5
MEASURE NUMBER

EASURE NAME Institution's capital construction expenditure relevant to the local community

EFINITION

Total amount of dollars expended in the local community by an institution as a result of its capital construction expenditure. The capital expenditures include (1) purchase of land, (2) land improvement, (3) construction (building and parking lot), (4) building repair and improvement, (5) architect's fees, and (6) others that are specifically designated by each institution as "capital construction."

DATA SOURCES

Institutional Business Office

PROCEDURES

Search of Institutional Records

COMMENTS

This outcome measure is identified as a potential measure of an institution's Financial Impact on the Community (3.2.0.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE K-5

It should be pointed out at the outset that the complexity of the data acquisition procedures for outcome measure K-5 is dependent upon the level of detail the user wishes to explore regarding capital expenditure. For instance, the institution may contract with a firm that in turn may subcontract with other firms. Therefore, the original contractor may disperse its capital over several localities through a subcontract process. The potential complexities involved in this process suggest that for analytic purposes some constraints must be placed on the level of detail associated with the flow of an institution's capital expenditures out to the designated functional local community.

The following procedure calls for examination of only those capital expenditures associated with the *original* contracts arranged between the institution and the local firms. In addition, it is recommended that the focus be limited to the original amount of dollars specified in the contract.

Procedures for Use of Institutional Records

The following procedural steps are designed to obtain that portion of an institution's capital dollars that are spent in the local designated functional community:

1. Identify the period of time in which the capital expenditures in the local community are to be examined.
2. Determine the boundaries of the *functional local community*.

3. Consult the institution's business office to examine the institution's State of Changes in Fund Balance and its supporting documents.

The Statement of Changes in Fund Balance shows the total amount of capital expenditures including the major components over a given year. It does not, however, provide the localities in which the capital budget has been spent. The supporting documents will show in detail from whom the land was purchased, if any, what specific projects were financed, and to whom contracts were awarded.

4. Examine carefully the supporting documents and identify for each project (or fiscal transaction):
   a. The address(es) of the firm(s) (or individuals) from which land was purchased, if any;
   b. The address(es) of the firm(s) to which contracts were awarded; and,
   c. The amount of dollars associated with each financial transaction.
5. Select the projects and the firms located in the designated local community.
6. The following table is suggested for organizing the capital expenditure data:

Type of capital expenditures	Name of the localities in which capital budget is spent	Amount of dollars
	TOTAL:	

K-6
MEASURE NUMBER

MEASURE NAME Local expenditures by faculty and staff

DEFINITION

Total amount of dollars that the faculty and staff in an institution spend in the local community during a certain period of time

DATA SOURCES

Institutional Faculty and Staff

PROCEDURES

Administration of a Survey Questionnaire

COMMENTS

This outcome measure is identified as a potential measure of an institution's *Financial Impact on the Community* (3.2.0.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE K-6

The set of questionnaire items developed for obtaining the data needed for outcome measure K-6 is a modification of a group of the items used in a recent community impact study conducted by the Office of the Vice-President for University Relations at the University of Colorado (Rautenstraus, 1974). The items have been modified with the permission of the author of the study report.

Procedures for a FACULTY and STAFF Questionnaire

[SEE FOLLOWING PAGE]

The following items are intended to help in estimating the economic impact of [Name of Institution] on the local community.

1. What is your primary employment status at [Name of Institution]?

   ___(1) Full-time Faculty

   ___(2) Part-time Faculty

   ___(3) Full-time Staff

   ___(4) Part-time Staff

2. Approximately how far do you live from campus? (Please write in the space below the estimated number of miles.)

   ______ Miles

3. In what type of housing do you reside?

   ___(1) Rent

   ___(2) Own home

4. Please estimate your average monthly expenditures in the folowing categories: [*NOTE: These estimates will be strictly confidential.*]

Rent or house payment	$______
Utilities (water, gas, electric, telephone, disposal) . .	$______
Food and beverages	$______
Real estate and other local taxes	$______
Automobile (payment, repairs, gas, insurance)	$______
Charitable donations.	$______
Cleaning and laundry.	$______
Clothing	$______
Entertainment	$______
Furniture	$______
Health (include dental and insurance)	$______
Insurance (except auto and health).	$______
Local public transportation	$______
Magazines and newspapers.	$______
Personal items	$______
Miscellaneous	$______
TOTAL	$______

5. What is your yearly expenditure for books and educational supplies? $______

K-7
MEASURE NUMBER

MEASURE NAME Local expenditures by students

DEFINITION

Total amount of dollars that students spend in the local community during a certain period of time

DATA SOURCES

Current Students

PROCEDURES

Administration of a Survey Questionnaire

COMMENTS

This outcome measure is identified as a potential measure of an institution's Financial Impact on the Community (3.2.0.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE K-7

The set of questionnaire items developed for obtaining the data needed for outcome measure K-7 is a modification of a group of the items used in a recent community impact study conducted by the Office of the Vice-President for University Relations at the University of Colorado (Rautenstraus, 1974). The items have been modified with the permission of the author of the study report.

Procedures for a CURRENT-STUDENT Questionnaire

[SEE FOLLOWING PAGE]

The following questions are intended to help us learn about the economic impact students at [Name of Institution] have on the local community.

1. What is your student status at [Name of Institution]? (PLEASE CHECK ONE)

___(1) Freshmen ___(4) Senior

___(2) Sophomore ___(5) Graduate

___(3) Junior ___(6) Special

2. Are you currently a full-time or part-time student?

___(1) Full-time student ___(2) Part-time student

3. Approximately how far do you live from campus? (Please write in the space below the estimated number of miles.)

_____ Miles

4. In what type of housing do you live? (PLEASE CHECK ONE)

___(1) Campus housing ___(4) Fraternity or Sorority

___(2) Rent ___(5) Live with parents

___(3) Own home

5. Please estimate your average monthly expenditures in the folowing categories: [*NOTE: These estimates will be strictly confidential.*]

Rent or house payment . . . . $______
Utilities (water, gas, electric, telephone, disposal) . . $______
Food and beverages . . . . $______
Real estate and other local taxes . . . . $______
Automobile (payment, repairs, gas, insurance) . . . . . . $______
Charitable donations. . . . . $______
Cleaning and laundry. . . . . $______
Clothing . . . . $______
Entertainment . . . . $______
Furniture . . . . $______
Health (include dental and insurance) . . . . $______
Insurance (except auto and health). . . . . $______
Local public transportation . . . . $______
Magazines and newspapers. . . . . $______
Personal items . . . . $______
Miscellaneous . . . . $______
TOTAL $______

6. What is your yearly expenditure for books and school supplies? $______

Tuition and fees? $______

K-8
MEASURE NUMBER

MEASURE NAME

Local expenditures by visitors

DEFINITION

A total amount of dollars that visitors to an institution spend in the local community during a certain period of time

DATA SOURCES

Faculty, staff, students, and academic units, (such as departments and institutes) and visitors

PROCEDURES

Administration of a Survey Questionnaire

COMMENTS

This outcome measure is identified as a potential measure of an institution's Financial Impact on the Community (3.2.0.04) in the NCHEMS Inventory of Higher Education Outcome Variables and Measures--see Appendix A.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE K-8

Administration of a survey questionnaire is suggested for obtaining an estimate of the total amount of dollars that visitors at an institution spend in the designated functional local community during a given period of time.

Three alternative sets of questionnaire items have been developed for consideration. The first set is appropriate for administration to faculty, staff, and students. The second set is designed to be administered to the heads of departments or other organizational units in the institution that have sponsored activities attended by visitors from outside the designated functional local community. The final set of items is designed to be administered directly to visitors.

Procedures for VISITOR-EXPENDITURE Questionnaires

[SEE FOLLOWING PAGE]

Alternative #1: Faculty/Staff/Student Questionnaire

FACULTY/STAFF/STUDENT QUESTIONNAIRE

INSTRUCTIONS: The following survey questionnaire is intended to learn how much money your non-local visitors have spent during [Period of Time] in [Name of the local community]. For each type of visitor identified below, please give your best estimates about (1) the number of non-local visitors you have had during [Period of Time]--count each visitor's visit as one visitor; (2) the average length of their stay--count days; and (3) the average amount of their daily spending.

	1	2	3	4
Type of non-local visitors	Number of visitors	Average length of their stay	Average daily local expenditures	Sum = 1x2x3 (Do not write in this column)
Parents & Relatives	___	( ) Days	$________	
Friends	___	( ) Days	$________	
Professional Colleagues	___	( ) Days	$________	
All Others	___	( ) Days	$________	
Grand Total				

Alternative #2: Organizational Unit Questionnaire

ORGANIZATIONAL UNIT QUESTIONNAIRE

INSTRUCTIONS: The following survey questionnaire is designed to estimate the amount of local expenditures that have resulted from the non-local visitors who have participated in meetings (or conferences) that your organization has sponsored during [Period of Time].*

1. Your name ____

2. Name of your department ________________________________

3. During (period of time) has your department (or organization) sponsored any activities, meetings, or conferences, etc. that were held in [Name of the Local Community] and in which visitors outside the community participated?

_____1. YES, we have. (Go to Question 4)

_____2. NO, we have not.

4. Please identify the nature (or name) of meetings and make your best estimate in the categories that follow:

	1	2	3	4
Nature (or name) of activity	Number of days activity lasted	Estimated number of non-local participants	Estimate Average Daily local expenditures of participants	SUM = 1x2x3 (Do not write in this column)

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*In some instances, the user may wish to account for visitors who come to the community for conferences, workshops, etc. that are held in campus facilities which are not sponsored by IHE.

Alternative #3: Visitor Questionnaire

The following questionnaire has been developed as an alternative for identifying the amount of money spent by visitors to the local community. The items in the questionnaire are modified versions of items used in a recent community impact study conducted by the University of Colorado (Rautenstraus, 1974). They have been modified for inclusion in this manual with the permission of the author of the University of Colorado community impact study report.

Various formats and procedures for administering the questionnaire to visitors can be used. The one recommended here calls for (1) printing the INTRODUCTORY REMARKS and questionnaire items on one side of an 8 1/2 x 11 inch piece of paper and (2) printing the return address and a first class business reply mail permit on the other side of the paper.

Alternative #3: Visitor Questionnaire

VISITOR QUESTIONNAIRE

WELCOME! The [Name of Institution] hopes thay you have a good time in [Name of Community]. The [Name of Institution] is conducting a survey to determine how much a visitor spends in [Name of Community]. When your visit is completed, please fill out this questionnaire and return it to us.

To return the questionnaire, please refold and staple the questionnaire so that the top third is covered by the bottom third and the [Name of Institution] address and prepaid postage notice is shown.

Thank you for your help!

* *

1. How far did you travel to come to [Name of Community]? ______ Miles

2. How long did you stay in [Name of Community]? ______ Days

3. What were your expenditures in [Name of Community] in the following categories?

   Food (off-campus) . . . . $________
   Lodging . . . . $________
   Other (souvenirs, gas, etc.). . . . . $________

4. Was your primary reason for visiting [Name of Community] related to the [Name of Institution]?

   ____ Yes
   ____ No

5. Please check (✓) the [Name of Institution] activities that you attended during your stay:

   ____ Seminar
   ____ Conference
   ____ Forum
   ____ Workshop
   ____ Lecture
   ____ Concert
   ____ Exhibit
   ____ Film
   ____ Museum
   ____ Athletic Contest
   ____ Social Event
   ____ Other ____________________
   ____ Visit with son/daughter attending [Name of Institution]

On the other side of the questionnaire print the return address and the business reply mail permit so the respondent can easily fold and staple the questionnaire. An example of what the other side of the questionnaire might look like is presented on the next page.

Obviously, other formats could be used for developing this type of visitor questionnaire. A good person to consult is a graphic arts specialist.

FIRST CLASS
PERMIT NO.
BOULDER, COLO.

BUSINESS REPLY MAIL

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

POSTAGE WILL BE PAID BY

[Name of Institution]

[Address to Which Questionnaire
is to be Returned]

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APPENDIX A

INVENTORY OF HIGHER EDUCATION OUTCOME VARIABLES AND MEASURES

[Extracted from Micek and Wallhaus, 1973]

THE

INVENTORY OF HIGHER EDUCATION OUTCOME VARIABLES AND MEASURES:

AN OVERVIEW

The Outcomes of Higher Education project of the National Center for Higher Education Management Systems at WICHE hopes to make significant contributions to solving the problems associated with identifying and using outcome information in planning and management. NCHEMS's first effort has been an attempt to develop an inventory of possible outcome variables with suggestions for their measurement. The sections that follow describe the inventory and its use.

Development of the Inventory

One major problem associated with incorporating the outcomes of higher education into planning and decision making processes has been the lack of a "common outcomes language" necessary for communicating and understanding the outcomes and benefits of higher education programs. To some degree this situation parallels the difficulties biologists faced prior to the development of Linneaus's taxonomy, which provided a common language or inventory for identifying and categorizing the various hierarchies of living organisms. Once the taxonomy was completed, however, biologists were in a better position to identify, measure, and analyze the characteristics and changes of the various species. Consequently, their knwoledge about plant and animal organisms increased, and their communication about these organisms with other scientists improved.

Similarly, higher education has difficulty communicating about benefits or results. Barriers are encountered when attempts are made to translate goal statements into terms of program outcomes, and program comparisons are thwarted because structures, definitions, and measures are lacking. While developing a communication base for higher education outcomes is by no means a total or final solution, it is a necessary step. Recognition of the potential benefits of such a communication base has led NCHEMS to develop the Inventory of Higher Education Outcome Variables and Measures. This inventory lists and describes various outcomes of higher education and suggests potential measures or proxy measures of those outcomes.*

Basic to the inventory are two criteria. The first criterion is that the inventories must be of service to as many kinds and levels of planners and decision makers in higher education as possible. For example, they should aid students and parents in making better decisions about which institutions and programs will provide the most meaningful and appropriate educational experiences. They should help institutional administrators and program managers account for the educational resources allocated and utilized in terms of the outcomes and benefits produced and the goals attained. Finally, they should provide legislators and statewide coordinating agencies with a better understanding of the intended as well as the unintended consequences of higher education.

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*NCHEMS also has developed an Inventory of Institutional Environment Variables and Measures that includes various combinations of resource measures, financial measures, activity measures, and target and beneficiary group measures. The development of this inventory recognizes that institutions do design programs and allocate resources to produce certain important environmental outcomes. For example, institutions of higher education create programs and allocate resources to develop certain types of facilities that will promote a unique intellectual and/or social atmosphere. While the creation of this unique atmosphere may be a desired outcome, it is pursued with the belief that it will eventually contribute to better student learning, better research, or better service for the students and the community in general. In addition, environmental measures can be used as meaningful proxies for outcomes, if the outcomes cannot be measured directly. For example, the number of library volumes acquired per student may serve as a proxy measure of student growth and development.

For your information, drafts of this inventory are available upon request.

The second criterion employed in developing the inventory is that it must provide a relatively complete characterization of an instituion's programs. The variables listed in the outcomes inventory should include not only academic and instructional outcomes, but research and community service outcomes as well.

The inventory has been developed to include comprehensive lists of the outcome variables related to higher education programs and institutions. For the purpose of clarification, a variable in the context of the inventory is defined as some entity or quality capable of assuming one of a number of quantitative or qualitative values. For each outcome variable, the inventory presents a definition or pertinent description, and it suggests a list of potential measures that can provide the appropriate evidence or necessary data for assessing the designated variables.

The current outcomes inventory incorporates reactions and suggestions from many individuals concerned with higher education. The following major categories define the structure of the inventory.

Section 1.0: Student Growth and Development Outcome Variables

1.1.0: Knowledge and Skills Development

1.2.0: Social Development

1.3.0: Personal Development

1.4.0: Career Development

Section 2.0: Development of New Knowledge and Art Forms Outcome Variables

Section 3.0: Community Development and Service Outcome Variables

3.1.0: Community Development

3.2.0: Community Service

3.3.0: Longer Term Community Effects

Characteristics of the Inventory

The outcomes inventory can be further described by identifying certain key characteristics and limitations.

Comprehensiveness: While every attempt has been made to develop a comprehensive list of variables, it is highly probable that certain important outcome variables have been overlooked. Or, more likely, in certain cases the descriptions may be interpreted to exclude elements they are intended to encompass.

It is recognized also that different individuals, institutions, and agencies will establish different subsets of the variables they view as relevant. Such lists undoubtedly will eliminate certain variables, which will simply emphasize the fact that different individuals, institutions, and agencies have unique sets of objectives.

Disaggregation: If an attempt is made to map the inventory onto an institution's program structure, it may become apparent that incongruities exist at different levels of aggregation. For example, it is very difficult to associate many of the outcome variables, particularly those in the area of student values and attitudes, with any program classification below the entire campus except on a very arbitrary basis. A major reason for this aggregation problem is that higher education programs often produce joint outcomes. For example, a program in political science potentially affects students in terms of their "political" values and attitudes. Similarly, a program in history and sociology also can affect "political" values and attitudes. Consequently, attributing any change in students' "political" values and attitudes to a particular program or course is extremely difficult.

Redundancy: While developing a list of mutually exculsive outcome variables has been a key concern in the development of the inventory, the overlaps between variables in the inventory have not been entirely eliminated. For example, student values and attitudes toward "change and stability" are likely to intersect with "political" values and attitudes. Similarly, "vocational preparation" characteristically intersects with "general knowledge" and "communication skills."

Neutral Scale: The variables' definitions and descriptions are not intended to connote value judgments. Efforts have been made to eliminate the use of such value-laden terms as "increase," "gain," and "beneift." Each user of the inventory is expected to view the variable descriptions as a neutral scale, to which he can attach his own unique values in terms of his preferred evaluation standards or his desired levels of performance. For example, one institution may want to increase the importance its students attach to "socioeconomic aspirations," while another institution may desire to decrease the degree of emphasis placed on this variable. It is recognized that an implied value judgment is built into the inventory by virtue of the level of aggregation utilized. That is, since "communication skills" is listed and "mathematical skills" is not, the unintended implication may be that communication is more important than mathematics. However, every attempt has been made to maintain a consistent level of aggregation throughout the inventory.

Measures: Developing a comprehensive list of outcome measures is a large-scale task, and it should be clear that the suggested measures are not all-inclusive and, for that matter, they may not be the best available. Thus, each user of the Inventory should strive to identify or develop additional measures or proxy measures to gain as much information as possible about the outcome variables he is interested in assessing. The criteria for suggesting measures are based on judgments of their significance and practicality, primarily relative to data availability. Studies to determine the relationships between measures and their value, practicality, and interpretation remain to be accomplished.

OUTLINE OF THE INVENTORY OF HIGHER EDUCATION OUTCOME VARIABLES AND MEASURES

- 1.0 Student Growth and Development
  - 1.1.0 Knowledge and Skills Development
    - 1.1.1.00 Knowledge Development
      - 1.1.1.01 General Knowledge
      - 1.1.1.02 Specialized Knowledge
    - 1.1.2.00 Skills development
      - 1.1.2.01 Application and Knowledge Skills
      - 1.1.2.02 Critical Thinking and Reasoning Skills
      - 1.1.2.03 Creativity Skills
      - 1.1.2.04 Communication Skills
      - 1.1.2.05 Motor Skills
    - 1.1.3.00 Knowledge and Skills Attitudes, Values, and Beliefs
      - 1.1.3.01 Intellectual Disposition

  - 1.2.0 Social Development
    - 1.2.1.00 Social Skills
    - 1.2.1.01 Interpersonal Participation
    - 1.2.1.02 Leadership
    - 1.2.1.03 Citizenship
    - 1.2.2.00 Social Attitudes, Values and Beliefs
      - 1.2.2.01 Political
      - 1.2.2.02 Racial/Ethnic
      - 1.2.2.03 Personal Ehtics

1.2.2.04 Social Conscience

1.2.2.05 Socioeconomic Aspirations

1.2.2.06 Cultural Interest

1.3.0 Personal Development

1.3.1.00 Student Health

1.3.1.01 Physical Health

1.3.1.02 Mental Health

1.3.2.00 Student Personal Attitudes, Values, and Beliefs

1.3.2.01 Religious and Spiritual

1.3.2.02 Change/Stability

1.3.2.03 Self-Concept

1.410 Career Development

1.4.1.00 Career Preparation

1.4.1.00 Academic Preparation

1.4.1.02 Vocational Preparation

1.4.2.00 Career Attitudes, Values, and Beliefs

1.4.2.01 Achievement Orientation

1.4.2.02 Educational Aspirations

1.4.2.03 Educational Satisfaction

1.4.2.04 Vocational Aspirations

2.0 Development of New Knowledge and Art Forms

2.0.0.01 Discovery of New Knowledge

2.0.0.02 Interpretation and Application of New Knowledge

2.0.0.03 Reorganization of New Knowledge

- 3.0 Community Development and Service
  - 3.1.0 Community Development
    - 3.1.0.01 Community Educational Development
    - 3.1.0.02 Faculty/Staff Educational Development
  - 3.2.0 Community Service
    - 3.2.0.01 Extension Services
    - 3.2.0.02 Personal Services
    - 3.2.0.03 Extramural Cultural and Recreational Services
    - 3.2.0.04 Financial Impact on the Community
  - 3.3.0 Longer Term Community Effects
    - 3.3.0.01 Social Impact
    - 3.3.0.02 Economic Impact

OUTCOME VARIABLES	POTENTIAL MEASURES
1.0 Student Growth and Development 1.1.0 Knowledge and Skills Development 1.1.1.00 Knowledge Development 1.1.1.01 General Knowledge The familiarity with and understanding of facts and principles across several broad fields. The student's breadth of knowledge.	Note: Many of the measures listed in 1.4.0 Career Development may also apply in 1.1.0. 1.1.1.01 General Knowledge Measures - Average student score on those items from tests (e.g., CLEP - General Exam; SAT Area Exam) that measure breadth of knowledge.* - Average student change in breadth of knowledge as determined by comparing entering general knowledge test scores to subsequent test scores (e.g., on CLEP, the GRE, or SAT Area Exams) after ____ years. - Average student-reported score on a scale measuring degree of satisfaction with breadth of knowledge (based on a student survey).

*Standardized measures are referenced at the end of this inventory.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.1.1.02 Specialized Knowledge The familiarity with and understanding of facts and principles in the particular fields in which the student elects to study. The student's depth of knowledge.	1.1.1.02 Specialized Knowledge Measures - Average student score on those items from tests (e.g., CLEP Subject Exams, or GRE Area Exams) that measure depth of knowledge in special fields of study. - Average student change in depth of knowledge by discipline area as determined by comparing entering specialized knowledge test scores to subsequent test scores (e.g., on CLEP Subject Exams or GRE Area Exams) after ____ years. - Number of graduates accepting employment in their major field of study as a percentage of total graduates in that field. - Number of students passing certification or licensing exams (e.g., bar exam, CPA) on first attempt as a percentage of all students taking the exam. - Average student-reported score on scale measuring the degree of satisfaction with their knowledge gain in specialized fields of study (based on a student survey). - Number of graduates accepted for study in post-baccalaureate degree programs as a percentage of those applying.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.1.2.00 Skill Development 1.1.2.01 Application of Knowledge Skills The ability to relate relevant general or specialized knowledge to a problem and to implement a solution. Also, the ability to locate, retain, and filter relevant knowledge.	1.1.2.01 Application of Knowledge Skills Measures - Average student score on those items from tests (e.g., CLEP Subject Exams, GRE or SAT Area Exams, or the OPI-Thinking Introversion Scale) that measure ability to apply general or specialized knowledge. - Average student change in ability to apply knowledge as determined by comparing entering ability test scores to subsequent test scores (e.g., on CLEP Subject Exams, the GRE or SAT Area Exams) after ____ years. - Average student and/or former student-reported score on a scale measuring degree of satisfaction with their ability to apply what they know both in breadth and depth (based on a student and/or former student survey).
1.1.2.02 Critical Thinking and Reasoning Skills The ability to formulate and analyze problems and to employ rational processes to achieve increased understanding (e.g., the recognition of biased points of view in a speech or a book; the recognition of cause-and-effect relationships).	1.1.2.02 Critical Thinking and Reasoning Skills Measures - Average student score on tests (e.g., OPI-Theoretical Scale; KIT-Critical Thinking Index, Critical Thinking Orientation Scale, or Critical Thinking Benefits Scale; AVL-Theoretical Scale) that measure ability to formulate and analyze problems. - Average student change in ability to formulate and analyze problems as determined by comparing entering critical thinking ability scores on tests (e.g., OPI-Theoretical Scale; KIT-Critical Thinking Index, Critical Thinking Orientation Scale, or Critical Thinking Benefits Scale; AVL-Theoretical Scale) to subsequent test scores after ____ years.

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Average student-reported score on scale measuring degree of satisfaction with their ability to apply what they know both in breadth and depth (based on a student survey). - Percentage of courses taken that are classified as emphasizing critical thinking and reasoning.
1.1.2.03 Creativity Skills The ability to design, produce, or otherwise bring into existence original perspectives, explanations, and implementations (e.g., the production of unique communication; the development of an effective plan or solution to a problem; or the creation of works of art).	1.1.2.03 Creativity Skills Measures - Average student score on tests (e.g., OPI-Complexity of Outlook Scale; KIT-Art Scale, Music Scale, Literature Scale, or Drama Scale; AVL-Aesthetic Scale) that measure the ability to create original perspectives, explanations, and implementations. - Average student change in ability to create original perspectives, explanations, and implementations as determined by comparing entering creative ability scores on tests (e.g., OPI-Complexity of Outlook Scale; KIT-Art Scale, Music Scale, Literature Scale, or Drama Scale; AVL-Aesthetic Scale) to subsequent test scores after ____ years. - Average student-reported score on a scale measuring degree of satisfaction with their ability to create original perspectives, explanations, and implementations (based on a student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Percentage of courses taken that are classified as emphasizing creativity. - Number of patents awarded/copyrights obtained by former students within the past ____ years (based on a former student survey).
1.1.2.04 Communication Skills The ability or competence to read, write, speak, and listen. The ability to convey information, attitudes, emotions, etc.; and also the ability to receive and interpret communications. These skills also encompass nonoral, nonwritten expression and perception.	1.1.2.04 Communication Skills Measures - Average student score on tests that measure the ability to communicate. - Average student change in ability to communicate as determined by comparing entering scores on tests of communicative ability to subsequent test scores after ____ years. - Percentage of courses taken that are classified as emphasizing communication skills. - Number of students participating in debate, encounter groups, etc., as a percentage of all students.
1.1.2.05 Motor Skills The ability or competence in tasks requiring physical dexterity and skill.	1.1.2.05 Motor Skills Measures - Average student score on tests that measure motor skills. - Average student change in motor skills as determined by comparing entering skill test scores to subsequent test scores after ____ years. - Number of students participating in intramural and varsity athletics as a percentage of all students. - Percentage of courses taken that are classified as emphasizing motor skills.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.1.3.00 Knowledge and Skills Attitudes, Values, and Beliefs	
1.1.3.01 Intellectual Disposition The desire to continue self-initiated study and inquiry for its own sake and/or for personal enjoyment.	1.1.3.01 Intellectual Disposition Measures - Average student change in perception and evaluation of their interest in continued self-initiated study and inquiry as determined by comparing entering test scores on (e.g., AVL-Intellectual Scale; KIT-Intellectual Orientation Scale) to subsequent test scores after ____ years. - Percentage of students taking noncredit, independent study, or special courses. - Average student-reported score on a scale measuring their evaluation and perception of the amount of learning that took place outside of formal instruction (based on a student survey). - Number of books, records, tapes, and other library materials checked out per student over a specified period of time.
1.2.0 Social Development 1.2.1.00 Social Skills	
1.2.1.01 Interpersonal Participation The ability to live and interact with others. This variable may be further disaggregated into such categories as cooperation, friendly companionship, and organizational skills; the ability to handle stress, isolation, and bias.	1.2.1.01 Interpersonal Participation Measures - Average number of memberships per student and/or former student in social, charitable, political, or civic organizations (based on a student and/or former student surveys).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Average number of awards and citations earned per student and/or former student for social contributions (based on a student and/or former student survey). - Student and/or former student perceptions and evaluations of their interpersonal participation as determined by selected measures (e.g., AVL-Social Scale; CUES-Community Scale; F-Scale; KIT-Interpersonal Index; Learning: Experiential Scale and Feeling About Other People Scale; ISS-Social Subscale of Institutional Goals Section). - Average number of friends and acquaintances reported per student (based on a student survey).
1.2.1.02 Leadership The ability to establish directions or courses of action and influence others to follow.	1.2.1.02 Leadership Measures - Average number of positions in local, state, and federal government held by students and/or former students (based on a student and/or former student survey). - Average number of offices in social, charitable, political, or civic organizations held by students and/or former students (based on a student and/or former student survey). - Students and/or former students participating in special social development programs; e.g., the Peace Corps and VISTA (based on a student and/or former student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Percentage of former students in management positions by the __th year following graduation (based on a former student survey). - Student and/or former student perceptions and evaluations of their leadership ability as determined by selected measures (e.g., AVL-Political; F-Scale).
1.2.1.03 Citizenship The ability to perform relative to the rights, duties, and privileges of a member of a community, state, or nation.	1.2.1.03 Citizenship Measures - Percentage of students and/or former students who voted in the last general election (based on a student and/or former student survey). - Average amount of monetary contributions per individual made to political, religious, and social organizations or special interest groups over past year relative to income category (based on a student and/or former student survey). - Student and/or former student perceptions and evaluations of their performance as citizens as determined by selected measures (e.g., KIT-Community Affairs Scale, National and State Politics Scale, and International and Intercultural Affairs Scale). - Average number of hours per month devoted to political, religious, and social organizations or special interest groups over the past year per student (based on a student and/or former student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
1.2.2.00 Social Attitudes, Values, and Beliefs	
1.2.2.01 Political Attitudes toward systems of government, including the processes, institutions, conventions, and the level of political participation.	1.2.2.01 Political Attitude Measures - Percentage of students and/or former students belonging to or holding office in political organizations (based on a student and/or former student survey). - Student and/or former student perceptions and evaluations of their political attitudes and beliefs as determined by selected measures (e.g., AVL-Political Scale; F-Scale; KIT-National and State Politics Scale, Community Affairs Scale, National Status and World Security Scale, Freedom of Expression Scale, Societal Viewpoints Scale). - Percentage of former students utilizing mechanisms of the political process; e.g., petitions circulated, hearings attended, letters written, lobbying activities (based on a former student survey).
1.2.2.02 Racial/Ethnic Attitudes toward races or national origins other than one's own.	1.2.2.02 Racial/Ethnic Attitude Measures - Student and/or former student perceptions and evaluations of their racial and ethnic attitudes and beliefs as determined by selected measures (e.g., KIT-Minority Problems Scale; E-Scale).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Number of students and/or former students who are partners in an interracial marriage as a percentage of survey sample (based on student and/or former student surveys). - Percentage of elected student offices held by members of ethnic minorities.
1.2.2.03 Personal Ethics Ethical and moral values that affect an individual's actions and thoughts toward others. The sense of what is right or wrong in one's conduct and motives in dealings between individuals and groups.	1.2.2.03 Personal Ethics Measures - Student and/or former student perceptions and evaluations about their ethical and moral values as determined by selected measures (e.g., AVL-Religious Scale and Social Scale; KIT-Feelings About Other People Scale). - Percentage of former students arrested on felony and misdemeanor charges during the last ____ years (based on former student survey).
1.2.2.04 Social Conscience The concern for human welfare. The importance placed on human interests, values, and conditions.	1.2.2.04 Social Conscience Measures Note: Many of the measures suggested in 1.2.1.01 Interpersonal Participation and 1.2.1.03 Citizenship also apply here. - Student and/or former student perceptions and evaluations about their concern for human welfare as determined by selected measures (e.g., AVL-Social Scale; KIT-Societal Viewpoints Scale, Human Relations Scale, Societal Priorities Scale; OPI-Social Maturity Scale).

OUTCOME VARIABLES	POTENTIAL MEASURES
1.2.2.05 Socioeconomic Aspirations The importance attached to one's socioeconomic status.	1.2.2.05 Socioeconomic Aspirations Measures - Average student and/or former student-reported score on scales measuring perceptions and evaluations of their current and desired social and economic level (based on a student and/or former student survey).
1.2.2.06 Cultural Interest The interest in and acquaintance with arts, manners, scholarly pursuits, and other qualities that characterize civilizations.	1.2.2.06 Cultural Interest Measures - Student and/or former student perceptions and evaluations of their interest in culture as determined by selected measures (e.g., KIT-Educational Benefits: Humanistic Scale). - Percentage of courses (credit and/or noncredit) taken that are classified as emphasizing cultural interests.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.3.0 Personal Development 1.3.1.00 Student Health	
1.3.1.01 Physical Health The physical well-being of students and/or former students.	1.3.1.01 Physical Health Measures - Percentage of students and/or former students reporting physical illnesses, by type of illness (based on a student and/or former student survey).
1.3.1.02 Mental Health The mental well-being of students and/or former students.	1.3.1.02 Mental Health Measures - Percentage of students and/or former students reporting mental illnesses, by type of illness (student and/or former student survey). - Percentage of students participating in special mental health counseling programs.
1.3.2.00 Student Personal Attitudes, Values, and Beliefs	
1.3.2.01 Religious and Spiritual Attitudes toward and adherence to the conventions, practices, and teachings of religious organizations or sects.	1.3.2.01 Religious and Spiritual Attitude Measures - Percentage of students and/or former students belonging to or holding office in religious organizations (based on a student and/or former student survey). - Student and/or former student perceptions and evaluations of their religious and spiritual attitudes and beliefs as determined by selected measures (e.g., AVL-Religious Scale; KIT-Religion Scale and General Values & Ideologies Scale; OPI-Religious Liberalism Scale; T-CR). - Percentage of students regularly attending religious services.

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Average monetary contribution per former student to religious organizations relative to income category (based on a former student survey).
1.3.2.02 Change/Stability Attitudes toward new and different ideas, relationships, products, or methods. The desire to introduce, avoid, or be associated with changes.	1.3.2.02 Change/Stability Attitude Measures - Student and/or former student perceptions and evaluations about their attitudes and beliefs toward new and different things as determined by selected measures (e.g., KIT-Areas and Agents of Change Scale, Involvement in Campus Reforms Scale; Rokeach Dogmatism Scale). - Average number of changes in employment per former student during the past ____ years (based on a former student survey).
1.3.2.03 Self-Concept The feeling and acceptance of oneself as having basic worth and value.	1.3.2.03 Self-Concept Measures - Student and/or former student perceptions about oneself as determined by selected measures (e.g., KIT-Feelings About Self Scale).

OUTCOME VARIABLES	POTENTIAL MEASURES
1.4.0 Career Development	
1.4.1.00 Career Preparation	
1.4.1.01 Academic Preparation The ability to seek, gain, and maintain a particular level and kind of academic pursuit.	1.4.1.01 Academic Preparation Measures - Average number of awards and citations received per graduate for academic performance (based on a former student survey). - Percentage of graduates working toward or receiving an advanced degree or certificate ____ years after graduation (based on a former student survey). - Percentage of graduates enrolled in graduate school ____ years after graduation (based on a former student survey). - Average student and/or former student-reported score on a scale measuring the degree of satisfaction with their academic performance (based on a student and/or former student survey). - Number of dropouts during the past year as a percentage of their academic rank or the total institution enrollment. - Number of students graduating from the institution after ____ years as a percentage of the entering class. - Number of graduates who transferred in as a percentage of total graduates for the year.

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Percentage of students changing major (lower division, upper division, and/or graduate) during the past year.
1.4.1.02 Vocational Preparation The ability to seek, gain, and maintain a particular level and kind of employment.	1.4.1.02 Vocational Preparation Measures - Percentage of former students employed within ____ days after graduation (based on a former student survey). - Average first salary of former students (based on a former student survey). - Average income category for former students after ____ years (based on a former student survey). - Percentage of dropouts employed within ____ days after dropping out (based on a survey of dropouts). - Average score of dropouts on a scale measuring the degree of satisfaction with their vocational performance (based on a survey of dropouts). - Average number of professional awards and citations received by former students (based on a former student survey). - Percentage of former students in management positions by the ____ th year following graduation (based on a former student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Average score reported by former students on a scale measuring satisfaction with their vocational performance (based on a former student survey). - Number of former students who desire to have their children follow the same career field as a percentage of the total number of former students surveyed (based on a former student survey). - Average number of voluntary/involuntary changes in employment over given time periods per former student (based on a former student survey). - Percentage of total graduates employed in-state versus out-of-state. - Average number of voluntary/involuntary changes in career field over given time periods per former student (based on a former student survey).
1.4.2.00 Career Attitudes, Values, and Beliefs 1.4.2.01 Achievement Orientation The importance placed upon accomplishments; i.e., successfully completing work that is valued by the individual and/or society. Impact or benefit as viewed by the student and/or the larger society.	1.4.2.01 Achievement Orientation Measures - Student and/or graduate perceptions and evaluations of achievement as determined by selected measures (e.g., KIT-Feelings About the Future Scale).

OUTCOME VARIABLES	POTENTIAL MEASURES
1.4.2.02 Educational Aspirations **The educational degree and/or competency level desired and valued by students and/or graduates.**	1.4.2.02 Educational Aspirations Measures - Percentage of students identifying the ___ degree (none, associate, bachelor's, master's, doctoral, other) as the highest degree planned (based on a student survey). - Percentage of graduates working toward or receiving an advanced degree ___ years after graduation (based on a former student survey).
1.4.2.03 Educational Satisfaction **The degree of student satisfaction with their educational experience.**	1.4.2.03 Educational Satisfaction Measures - Percentage of former students who intend to send their children to the same school (based on a former student survey). - Average amount of alumni gifts ____ years after their graduation. - Average student and/or former student-reported score on a scale measuring the degree of satisfaction with their educational experience (based on a student and/or former student survey).
1.4.2.04 Vocational Aspirations **The level of attainment in a profession desired by students and/or graduates.**	1.4.2.04 Vocational Aspirations Measures - Average first salary expectations of students (based on a student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Percentage of students and/or former students seeking certain professional levels in society (based on a student and/or former student survey).
2.0 Development of New Knowledge and Art Forms*	
2.0.0.01 Discovery of New Knowledge The identification and development of new knowledge, theories, and products without regard to practical application.	2.0.0.01 Discovery of New Knowledge Measures - Average number of basic research publications per student, former student, and/or faculty member over a given time period (based on a student, former student, and/or faculty survey). - Average number of times a given basic research publication is cited in bibliographies of other authors over a given time period (e.g., based on publications listed in Science Citation Index). (Note: both frequency and the time interval over which citations are made should be considered.) - Average percentage of faculty time spent in selected basic research activities (e.g., NCHEMS Faculty Activity and Outcome Survey - Section 8.1 Specific Research Projects). - Average number of proposals funded for the development of new ideas and products during _____ year(s). - Total dollar amount of gifts and/or grants received for the development of new ideas and products without concern for practicality as a percentage of total budget for ____ year(s).

***The current inventory does not contain variables and measures related to the development of New Art Forms.**

OUTCOME VARIABLES	POTENTIAL MEASURES
2.0.0.02 Interpretation and Application of New Knowledge The development and use of new knowledge, theories, and products with regard to practical application.	2.0.0.02 Interpretation and Application of New Knowledge Measures - Average number of applied research, development, and evaluation publications per student, graduate, and/or faculty member (based on a student, former student, and/or faculty survey). - Average percentage of time spent by faculty in selected applied research, development, and evaluation activities (based on NCHEMS Faculty Activity and Outcome Survey - B.1 Special Research Projects, E.2 Professional Service and Advice, and F.1 Academic Activity Outside the Institution). - Average number of awards and citations received per student, former student, and/or faculty member for applied research, development, and evaluation efforts (based on a student, former student, and/or faculty survey). - Average number of applied research, development, and evaluation proposals funded during past ___ year(s). - Total dollar amount of gifts, contracts, or grants received for applied research, development, and evaluation as a percentage of total budget for ___ year(s).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Average number of patents and/or copyrights received per student, former student, and/or faculty member over a given time period (based on a student, former student, and/or faculty survey).
2.0.0.03 Reorganization of New Knowledge The synthesis of existing theories, findings, and statements in order to present existing knowledge in a new form designed to be more readily comprehensible or usable (e.g., new textbooks, written articles, and oral communications).	2.0.0.03 Reorganization of New Knowledge Measures - Average number of textbooks, monographs, etc., published per faculty member (based on a faculty survey). - Average percentage of faculty time spent in reorganizing existing knowledge (based on NCHEMS Faculty Activity and Outcome Survey - Section A.4 Course and Curriculum Development). - Average number of films, taped lectures, etc., developed per faculty member (based on a faculty survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
3.0 Community Development and Service 3.1.0 Community Development	
3.1.0.01 Community Educational Development The growth and development of members of the community who are not working toward a degree or certification, but who are taking advantage of continuing education opportunities offered.	3.1.0.01 Community Educational Development Measures - Note: Measures listed in 1.1.1.01 General Knowledge, 1.1.1.02 Specialized Knowledge, 1.1.2.01 Application of Knowledge, 1.1.2.02 Critical Thinking and Reasoning Skills, and 1.1.2.03 Creativity can also be utilized as indicators of Community Educational Development. - Percentage of students in various instructional programs who are classified as nonmatriculating.
3.1.0.02 Faculty/Staff Educational Development The growth and development of faculty and staff either through their instruction, research, or management activities or through the continuing education opportunities offered.	3.1.0.02 Faculty/Staff Educational Development Measures - Percentage of faculty/staff who are taking courses in the institution. - Percentage of faculty time spent in selected activities (based on NCHEMS Faculty Activity and Outcome Survey - B.2 General Scholarship and Creative Work, F.1 Academic Activity Outside the Institution). - Faculty and staff perceptions and evaluations of their educational growth and development (based on a faculty/staff survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
3.2.0 Community Service	
3.2.0.01 Extension Services The extent to which the community receives direct assistance and services of various types from the primary programs of the institution (e.g., agriculture extension service, other noninstructional extension activities, faculty/staff consulting).	3.2.0.01 Extension Services Measures - Average percentage of faculty time spent in selected activities (based on NCHEMS Faculty Activity and Outcome Survey - E.2 Professional Service and Advice, F.1 Academic Activity Outside the Institution, F.2 Paid Professional Service). - Estimated replacement value of specific extension services received by individuals or organizations that receive the services. - Ratio of total income for extension services to total budget for extension services. - Income produced through extension services, as a percentage of the cost of offering the service(s). - Amount of release time granted faculty members per year for community service.

OUTCOME VARIABLES	POTENTIAL MEASURES
3.2.0.02 Personal Services The extent to which individuals in the community receive direct personal services of various types through the support programs and facilities of the institution (e.g., medical clinics that serve the general community, nursery schools, access to the library, and computer center).	3.2.0.02 Personal Services Measures - Number of individuals not associated with the institution who were served by a particular institutional support program (e.g., the computing center, the library, etc.) as a percentage of the total number of individuals served over a given time period. - Estimated monetary value of specific personal services offered relative to other comparable services offered elsewhere.
3.2.0.03 Extramural Cultural and Recreational Services The availability and utilization of the recreational and cultural opportunities offered through the institution to the community (e.g., sporting events, the performing arts, museum exhibits, and concerts).	3.2.0.03 Extramural Cultural and Recreational Services Measures - Estimated number of nonstudents, nonfaculty, and nonstaff attending selected extramural events as a percentage of the total number attending.

OUTCOME VARIABLES	POTENTIAL MEASURES
3.2.0.04 Financial Impact on the Community The economic benefits or costs directly and indirectly accruing to the community as a result of the operation of the institution, including such elements as: 1) purchases of goods and services by the institution, its students, and its faculty; 2) students available as employees; 3) drawing power of the community for industry and as a place of residence for employees.	3.2.0.04 Financial Impact on the Community Measures - Total dollar amount of goods and services purchased by the institution from a particular sector of the community during the past year. - Estimated average dollar amount of expenditures by students in the community. - Number of students employed in businesses, agencies, and organizations in the community as a percentage of the total student enrollment (based on student survey). - Total dollar amount of the institution's payroll as a percentage of the estimated total community payroll.

OUTCOME VARIABLES	POTENTIAL MEASURES
3.3.0 Longer Term Community Effects	
3.3.0.01 Social Impact The long-term social effects of the institution, primarily through its former students, on the community of the institution.	3.3.0.01 Social Impact Measures Note: Many of the measures listed in Section 1.2.0 Social Development and 1.3.0 Personal Development can be applied equally well over long time periods and also to children of former students if attempts are made to identify intergenerational effects.
3.3.0.02 Economic Impact The long-term economic effect of the institution, primarily through its former students, on the community.	3.3.0.02 Economic Impact Measures Note: Many measures listed in Sections 1.2.2.05 Socioeconomic Aspirations, 1.4.1.02 Vocational Preparation, 1.4.2.04 Vocational Aspirations, and the research-oriented outcome indicators in Section 2.0 Development of New Knowledge and Art Forms can be applied equally well over long time periods.

APPENDIX B

LISTS OF OCCUPATIONS AND EDUCATIONAL PROGRAMS*

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*Two lists of occupations and educational programs (major field of study) are contained in this appendix. List B.1 has been developed by NCHMES for use in the Information Exchange Procedures Outcomes Study Procedures, Technical Report 66 (Byers, 1975). List B.2 has been developed and used by the American College Testing Program in the 1974-75 edition of the "ACT Interest Inventory and Student Profile Section." It is presented here with the permission of the ACT Program.

LIST B.1

LIST OF OCCUPATIONS AND EDUCATIONAL PROGRAMS

If the appropriate program or occupation is not listed, please use the 999 code and write the program or occupation name in the space provided on the questionnaire.

- 030 AGRICULTURE AND NATURAL RESOURCES
  - 031 Agriculture, general
  - 032 Natural resources, general
  - 033 Agricultural business and economics
  - 034 Agricultural and farm management
  - 035 Agronomy and horticulture
  - 036 Animal, dairy, and poultry science
  - 037 Fish, game, and wildlife management
  - 038 Food science and technology
  - 039 Forestry, natural resource, and range management
  - 041 Ornamental horticulture (floristry and nursery science)

- 060 ARCHITECTURE AND ENVIRONMENTAL DESIGN
  - 061 Architecture, general
  - 062 Environmental design, general
  - 063 Architectural technology
  - 064 City, community, and regional planning

- 090 ASSEMBLY, INSTALLATION, MAINTENANCE, AND REPAIR
  - 091 Air conditioning, refrigeration, and heating equipment
  - 092 Aircraft and related equipment
  - 093 Appliances
  - 094 Automotive equipment
  - 095 Business machines (including computers and related equipment)
  - 096 Diesel equipment
  - 097 Electronics equipment (except radio and TV)
  - 098 Heavy machinery and equipment
  - 099 Radio and TV equipment

- 120 BIOLOGICAL SCIENCES
  - 121 Biology, general
  - 122 Botany
  - 123 Ecology
  - 124 Genetics
  - 125 Zoology

- 150 BUILDING AND CONSTRUCTION TRADES

- 180 BUSINESS, MANAGEMENT, AND COMMERCE
  - 181 Business and commerce, general
  - 182 Accounting
  - 183 Business management and administration
  - 184 Hotel and restaurant management
  - 185 Labor and industrial relations
  - 186 Marketing and purchasing
  - 187 Office management and operations
  - 188 Personnel management
  - 189 Recreation and tourism
  - 191 Sales
  - 192 Secretarial studies
  - 193 Transportation and public utilities management

- 210 COMMUNICATIONS
  - 211 Communications, general
  - 212 Advertising, information services, and public relations
  - 213 Journalism (printed media)
  - 214 Radio and television

- 240 COMPUTER AND INFORMATION SCIENCES
  - 241 Computer and information sciences, general
  - 242 Computer and peripheral equipment operations
  - 243 Computer programming
  - 244 Data processing
  - 245 Information sciences and systems
  - 246 Systems analysis

- 270 EDUCATION
  - 271 Education, general
  - 272 Counseling and guidance
  - 273 Educational administration
  - 274 Educational research and development (including curriculum)
  - 275 Elementary education (including preschool)
  - 276 Secondary education (including junior high)
  - 277 Higher and other postsecondary education
  - 278 Special education

- 300 ENGINEERING
  - 301 Engineering, general
  - 302 Aerospace, aeronautical, and astronautical engineering
  - 303 Automotive engineering
  - 304 Chemical engineering
  - 305 Civil, construction, and transportation engineering
  - 306 Drafting and design
  - 307 Electrical, electronics, and communications engineering
  - 308 Engineering support technologies
  - 309 Environmental and sanitary engineering
  - 311 Industrial and management engineering
  - 312 Mechanical engineering
  - 313 Mining and mineral engineering
  - 314 Petroleum engineering (excludes petroleum refining)

- 330 FINE, APPLIED, AND PERFORMING ARTS
  - 331 Art and applied design (e.g., ceramics, painting, sculpture, weaving
  - 332 Art history
  - 333 Graphic arts (e.g., engraving, etching, lithography)
  - 335 Performing arts (e.g., dance, drama, music)
  - 336 Photography and cinematography

- 360 FOREIGN LANGUAGES

- 390 HEALTH SERVICES
  - 391 Health services, general
  - 392 Dental or medical assistant services
  - 393 Dental or medical laboratory technologies
  - 394 Dental hygiene
  - 395 Dentistry
  - 396 Electrocardiograph and electroencephalograph technologies
  - 397 Hospital and health care administration
  - 398 Inhalation theraphy
  - 399 Medical records
  - 401 Medicine
  - 402 Mortuary science
  - 403 Nursing
  - 404 Optometry
  - 405 Osteopathic medicine
  - 406 Pharmacy
  - 407 Physical and occupational therapy
  - 408 Podiatry
  - 409 Public health and sanitation
  - 411 Radiologic technologies (e.g., X-ray)
  - 412 Speech pathology
  - 413 Veterinary medicine

- 420 HOME ECONOMICS AND HOMEMAKING
  - 421 Home economics and homemaking, general
  - 422 Clothing and textiles
  - 423 Consumer economics and home management
  - 424 Family relations and child development
  - 425 Foods and nutrition (including dietetics)
  - 426 Home decoration and home equipment

- 450 INTERDISCIPLINARY STUDIES

- 480 LAW

- 510 LETTERS
  - 511 Classics
  - 512 Comparative literature
  - 513 Creative writing
  - 514 English, general
  - 515 English literature
  - 516 Linguistics (includes phonetics, semantics and philology)
  - 517 Philosophy
  - 518 Religious studies (excludes theological professions)

- 540 LIBRARY SCIENCE

- 570 MACHINE TRADES

- 600 MATHEMATICS AND STATISTICS

- 630 MILITARY SCIENCES

- 660 PERSONAL SERVICES
  - 661 Barbering, cosmetology, and related services
  - 662 Food and beverage services
  - 663 Hotel and lodging services
  - 664 Other personal services

- 690 PHYSICAL SCIENCES
  - 691 Physical sciences, general
  - 692 Astronomy and astrophysics
  - 693 Atmospheric sciences and meteorology
  - 694 Chemistry, general
  - 695 Earth sciences, general
  - 696 Geology
  - 697 Metallurgy
  - 698 Oceanography
  - 699 Physics, general

- 720 PSYCHOLOGY
  - 721 Psychology, general
  - 722 Clinical psychology
  - 723 Experimental psychology
  - 724 Psychometrics

- 750 PUBLIC AFFAIRS AND SERVICES
  - 751 Community services, general
  - 752 Fire protection
  - 753 Law enforcement and corrections
  - 754 Parks and recreation
  - 755 Public administration
  - 756 Social work and helping services

- 780 SOCIAL SERVICES
  - 781 Social sciences, general
  - 782 Anthropology
  - 783 Archaeology
  - 784 Area studies
  - 785 Economics
  - 786 Ethnic studies
  - 787 Geography and demography
  - 788 History
  - 789 International relations
  - 791 Political science and government
  - 792 Sociology

- 810 THEOLOGY

- 998 UNDECIDED

- 999 OTHER (please write the name of the educational program or occupation in the space provided on the questionnaire)

LIST B.2

LIST OF OCCUPATIONS AND EDUCATIONAL PROGRAMS

100 AGRICULTURE, general
101 Agricultural Business
102 Agricultural Economics
103 Agricultural and Farm Management (farming and ranching)
104 Agriculture, Forestry, and Wildlife Technologies
105 Agronomy (field crops and crop management)
106 Animal Science (husbandry)
107 Fish, Game, and Wildlife Management
108 Food Science and Technology
109 Forestry
110 Horticulture/Ornamental Horticulture
111 Natural Resources Management (soil conservation)

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120 ARCHITECTURE, general
121 Architecture Technology
122 City, Community, and Regional Planning
123 Environmental Design, general
124 Interior Design

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130 BIOLOGICAL SCIENCES, general
131 Biology
132 Biochemistry
133 Botany
134 Ecology
135 Microbiology
136 Zoology

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140 BUSINESS AND COMMERCE, general
141 Accounting
142 Banking and Finance
143 Business Economics
144 Business Management and Administration
145 Food Marketing
146 Hotel and Restaurant Management
147 Labor and Industrial Relations
148 Office Management
149 Marketing and Purchasing (sales and retail)
150 Real Estate and Insurance
151 Recreation and Tourism
152 Secretarial Studies
153 Transportation and Public Utilities

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160 COMMUNICATIONS, general
161 Journalism
162 Radio/Television (related to broadcasting)
163 Advertising

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170 COMPUTER AND INFORMATION SCIENCES, general
171 Computer Programming
172 Information Systems and Sciences
173 Systems Analysis
174 Data Processing Technology
175 Computer Operating
176 Data Systems Repair

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180 EDUCATION, general
181 Agricultural Education
182 Art Education
183 Business, Commerce, and Distributive Education
184 Elementary Education
185 English Education
186 Home Economics Education
187 Industrial Arts, Vocational/Technical Education
188 Mathematics Education
189 Music Education
190 Physical Education
191 Science Education
192 Secondary Education, general
193 Social Science Education
194 Special Education
195 Speech Education

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200 ENGINEERING, general
201 Aerospace, Aeronautical, and Astronautical
202 Agricultural Engineering
203 Architectural Engineering
204 Chemical Engineering
205 Civil Engineering
206 Electrical, Electroncis, and Communications Engineering
207 Environmental and Ecological Engineering
208 Geological Engineering
209 Industrial and/or Management Engineering
210 Mechanical Engineering
211 Metallurgical and Materials Engineering
212 Mining and Mineral Engineering
213 Nuclear Engineering
214 Ocean Engineering
215 Petroleum Engineering

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220 FINE AND APPLIED ARTS, general
221 Applied Design (ceramics, weaving, commercial art)
222 Art (painting, drawing, sculpture)
223 Art History and Appreciation
224 Dance
225 Dramatic Arts (theater arts)
226 Music (liberal arts)
227 Music (performing, composition, theory)
228 Music History and Appreciation
229 Photography/Cinematography

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230 FOREIGN LANGUAGES, general
231 French
232 German
233 Italian
234 Latin
235 Spanish
236 Russian

LIST B.2 (continued)

240 HEALTH PROFESSIONS, general
241 Dentistry
242 Dental Assistant
243 Dental Hygiene
244 Dental Lab Technology
245 Environmental Health Technologies
246 Medicine
247 Medical Assistant or Medical Office Assistant
248 Medical or Laboratory Technology
249 Nursing (registered)
250 Nursing (licensed practical nurse)
251 Occupational Therapy
252 Optometry
253 Pharmacy
254 Physical Therapy
255 Public Health
256 Radiology
257 X-ray Technology
258 Surgical Technology (surgeon's assistant, etc.)
259 Veterinary Medicine

260 HOME ECONOMICS, general
261 Clothing and Textiles
262 Consumer Economics and Home Management
263 Family Relations and Child Development
264 Foods and Nutrition (including dietetics)
265 Institutional Management

270 LETTERS (Humanities), general
271 Classics
272 Comparative Literature
273 Creative Writing
274 English, general
275 Linguistics
276 Literature, English
277 Philosophy
278 Religion
279 Speech, Debate, Forensic Science

280 MATHEMATICS, general
281 Applied Mathematics
282 Statistics (mathematical and theoretical)

285 PHYSICAL SCIENCE, general
286 Astronomy
287 Chemistry
288 Earth Sciences
289 Geology
290 Oceanography
291 Physics

300 COMMUNITY SERVICE, general
301 Law Enforcement and Correction (police science)
302 Parks and Recreation Management
303 Public Administration
304 Social Work
305 Military

310 SOCIAL SCIENCES, general
311 Anthropology
312 Area Studies (American Civilization, American Studies, etc.)
313 Economics
314 Ethnic Studies (Asian Studies, Black Studies, Chicano Studies, etc.)
315 Geography
316 History
317 International Relations
318 Law (prelaw)
319 Political Science
320 Psychology
321 Sociology

330 TRADE, INDUSTRIAL, AND TECHNICAL, general
331 Agricultural Mechanics and Technology
332 Air-Conditioning, Refrigeration, and Heating Technology
333 Aeronautical and Aviation Technology
334 Appliance Repair
335 Automobile Body Repair
336 Automobile Mechanics
337 Business Machine Maintenance
338 Carpentry and Construction
339 Drafting/Engineering Graphics
340 Electricity and Electronics
341 Engineering Technology--Aeronautical
342 Engineering Technology--Automotive
343 Engineering Technology--Civil
344 Engineering Technology--Industrial/Manufacturing
345 Engineering Technology--Mechanical
346 Graphic Arts (printing, typesetting)
347 Heavy-Equipment Operating
348 Dry Cleaning, Laundry, and Clothing Technology
349 Industrial Arts
350 Leatherworking (shoe repair, etc.)
351 Machinework (tool and die, etc.)
352 Masonry (brick, cement, stone, etc.)
353 Metalworking
354 Plumbing and Pipefitting
355 Radio-TV Repair
356 Small-Engine Repair
357 Upholstering
358 Watch Repair and other Instrument Maintenance and Repair
359 Welding
360 Woodworking (cabinetmaking, millwork)

370 GENERAL STUDIES

000 Undecided

APPENDIX C

HIGHER EDUCATION GENERAL INFORMATION SURVEY (HEGIS) TAXONOMY

APPENDIX C

THE HEGIS TAXONOMY*

In view of the length and comprehensive nature of the Taxonomy of Instructional Programs, it may sometimes be diffucult to locate the appropriate reporting title for a specific instructional program. To facilitate the location process, a summary list of the program categories (discipline categories) is shown below.

PROGRAM (DISCIPLINE) CATEGORIES

(Conventional academic subdivisions of knowledge and training)

Code	
0000	GENERAL
0100	AGRICULTURE and NATURAL RESOURCES
0200	ARCHITECTURE and ENVIRONMENTAL DESIGN
0300	AREA STUDIES
0400	BIOLOGICAL SCIENCES
0500	BUSINESS and MANAGEMENT
0600	COMMUNICATIONS
0700	COMPUTER and INFORMATION SCIENCES
0800	EDUCATION
0900	ENGINEERING
1000	FINE and APPLIED ARTS
1100	FOREIGN LANGUAGES
1200	HEALTH PROFESSIONS
1300	HOME ECONOMICS
1400	LAW
1500	LETTERS
1600	LIBRARY SCIENCE
1700	MATHEMATICS
1800	MILITARY SCIENCES
1900	PHYSICAL SCIENCES
2000	PSYCHOLOGY
2100	PUBLIC AFFAIRS and SERVICES
2200	SOCIAL SCIENCES
2300	THEOLOGY
4900	INTERDISCIPLINARY STUDIES

(Technological and occupational specialties related to curriculums leading to associate degrees and other awards below the baccalaureate)

Code	
5000	BUSINESS and COMMERCE TECHNOLOGIES
5100	DATA PROCESSING TECHNOLOGIES
5200	HEALTH SERVICES and PARAMEDICAL TECHNOLOGIES
5300	MECHANICAL and ENGINEERING TECHNOLOGIES
5400	NATURAL SCIENCE TECHNOLOGIES
5500	PUBLIC SERVICE RELATED TECHNOLOGIES

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*Source: Robert A. Huff and Marjorie O. Chandler, A Taxonomy of Instructional Programs in Higher Education (Washington, D.C.: National Center for Educational Statistics, Office of Education, 1970).

PROGRAM (DISCIPLINE) SUBCATEGORIES

A listing of all probram (discipline) subcategories is given below by discipline categories. This section is included for purposes of definition to indicate which specific program subcategories are included in each program category.

0000 GENERAL USE

0100 AGRICULTURE AND NATURAL RESOURCES
- 0101 Agriculture, General
- 0102 Agronomy (Field Crops, and Crop Management)
- 0103 Soils Science (Management and Conservation)
- 0104 Animal Science (Husbandry)
- 0105 Dairy Science (Husbandry)
- 0106 Poultry Science
- 0107 Fish, Game, and Wildlife Management
- 0108 Horticulture (Fruit and Vegetable Production)
- 0109 Ornamental Horticulture (Floriculture, Nursery Science)
- 0110 Agricultural and Farm Management
- 0111 Agricultural Economics
- 0112 Agricultural Business
- 0113 Food Science and Technology
- 0114 Forestry
- 0115 Natural Resources Management
- 0116 Agriculture and Forestry Technologies
- 0117 Range Management
- 0199 Other, Specify

0200 ARCHITECTURE AND ENVIRONMENTAL DESIGN
- 0201 Environmental Design, General
- 0202 Architecture
- 0203 Interior Design
- 0204 Landscape Architecture
- 0205 Urban Architecture
- 0206 City, Community, and Regional Planning
- 0299 Other, Specify

0300 AREA STUDIES
- 0301 Asian Studies, General
- 0302 East Asian Studies
- 0303 South Asian (India, etc.) Studies
- 0304 Southeast Asian Studies
- 0305 African Studies
- 0306 Islamic Studies
- 0307 Russian and Slavic Studies
- 0308 Latin American Studies
- 0309 Middle Eastern Studies
- 0310 European Studies, General
- 0311 Eastern European Studies
- 0312 West European Studies
- 0313 American Studies
- 0314 Pacific Area Studies
- 0399 Other, Specify

0400 BIOLOGICAL SCIENCES
- 0401 Biology, General
- 0402 Botany, General
- 0403 Bacteriology
- 0404 Plant Pathology
- 0405 Plant Pharmacology
- 0406 Plant Physiology
- 0407 Zoology, General
- 0408 Pathology, Human and Animal
- 0409 Pharmacology, Human and Animal
- 0410 Physiology, Human and Animal
- 0411 Microbiology
- 0412 Anatomy
- 0413 Histology
- 0414 Biochemistry
- 0415 Biophysics
- 0416 Molecular Biology
- 0417 Cell Biology (Cytology, Cell Physiology)
- 0418 Marine Biology
- 0419 Biometrics and Biostatistics
- 0420 Ecology
- 0421 Entomology
- 0422 Genetics
- 0423 Radiobiology
- 0424 Nutrition, Scientific (exclude Nutrition in Home Economics and Dietetics)

0425 Neurosciences
0426 Toxicology
0427 Embryology
0499 Other, Specify

0500 BUSINESS AND MANAGEMENT

0501 Business and Commerce, General
0502 Accounting
0503 Business Statistics
0504 Banking and Finance
0505 Investments and Securities
0506 Business Management and Administration
0507 Operations Research
0508 Hotel and Restaurant Management
0509 Marketing and Purchasing
0510 Transportation and Public Utilities
0511 Real Estate
0512 Insurance
0513 International Business
0514 Secretarial Studies
0515 Personnel Management
0516 Labor and Industrial Relations
0517 Business Economics
0599 Other, Specify

0600 COMMUNICATIONS

0601 Communications, General
0602 Journalism (Printed Media)
0603 Radio/TV
0604 Advertising
0605 Communication Media (use of videotape, film, etc., oriented specifically toward radio/TV)
0699 Other, Specify

0700 COMPUTER AND INFORMATION SCIENCES

0701 Computer and Information Sciences, General
0702 Information Sciences and Systems
0703 Data Processing
0704 Computer Programming
0705 Systems Analysis
0799 Other, Specify

0800 EDUCATION

0801 Education, general
0802 Elementary education, general
0803 Secondary education, general
0804 Junior high school education
0805 Higher education, general
0806 Junior and community college education
0807 Adult and continuing education
0808 Special education, general
0809 Administration of special education
0810 Education of the mentally retarded
0811 Education of the gifted
0812 Education of the deaf
0813 Education of the culturally disadvantaged
0814 Education of the visually handicapped
0815 Speech correction
0816 Education of the emotionally disturbed
0817 Remedial education
0818 Special learning disabilities
0819 Education of the physically handicapped
0820 Education of the multiple handicapped
0821 Social foundations (history and philosophy of education)
0822 Educational psychology (include learning theory)
0823 Pre-elementary education (kindergarten)
0824 Educational statistics and research
0825 Educational testing, evaluation, and measurement
0826 Student personnel (counseling and guidance)
0827 Educational administration
0828 Educational supervision
0829 Curriculum and instruction
0830 Reading education (methodology and theory)
0831 Art education (methodology and theory)
0832 Music education (methodology and theory)
0833 Mathematics education (methodology and theory)
0834 Science education (methodology and theory)
0835 Physical education
0836 Driver and safety education
0837 Health education (include family life education)
0838 Business, commerce, and distributive education
0839 Industrial arts, vocational, and technical education
0899 Other, specify

0900 ENGINEERING

0901 Engineering, General
0902 Aerospace, Aeronautical, and Astronautical Engineering
0903 Agricultural Engineering
0904 Architectural Engineering
0905 Bioengineering and Biomedical Engineering
0906 Chemical Engineering (include Petroleum Refining)
0907 Petroleum Engineering (exclude Petroleum Refining)
0908 Civil, Construction, and Transportation Engineering
0909 Electrical, Electronics, and Communications Engineering
0910 Mechanical Engineering
0911 Geological Engineering
0912 Geophysical Engineering
0913 Industrial and Management Engineering
0914 Metallurgical Engineering
0915 Materials Engineering
0916 Ceramic Engineering
0917 Textile Engineering
0918 Mining and Mineral Engineering
0919 Engineering Physics
0920 Nuclear Engineering
0921 Engineering Mechanics
0922 Environmental and Sanitary Engineering
0923 Naval Architecture and Marine Engineering
0924 Ocean Engineering

0925 Engineering Technologies
0999 Other, Specify

1000 FINE AND APPLIED ARTS

1001 Fine Arts, General
1002 Art (Painting, Drawing, Sculpture)
1003 Art History and Appreciation
1004 Music (Performing, Composition, Theory)
1005 Music (Liberal Arts Program)
1006 Music History and Appreciation (Musicology)
1007 Dramatic Arts
1008 Dance
1009 Applied Design (Ceramics, Weaving, Textile Design, Fashion Design, Jewelry, Metalsmithing, Interior Decoration, Commercial Art)
1010 Cinematography
1011 Photography
1099 Other, Specify

1100 FOREIGN LANGUAGES

1101 Foreign Languages, General
1102 French
1103 German
1104 Italian
1105 Spanish
1106 Russian
1107 Chinese
1108 Japanese
1109 Latin
1110 Greek, classical
1111 Hebrew
1112 Arabic
1113 Indian (Asiatic)
1114 Scandinavian Languages
1115 Slavic Languages (other than Russian)
1116 African Languages (non-Semitic)
1199 Other, Specify

1200 HEALTH PROFESSIONS

1201 Health Professions, General
1202 Hospital and Health Care Administration
1203 Nursing
1204 Dentistry
1205 Dental Specialties
1206 Medicine
1207 Medical Specialties
1208 Occupational Therapy
1209 Optometry
1210 Osteopathic Medicine
1211 Pharmacy
1212 Physical Therapy
1213 Dental Hygiene
1214 Public Health
1215 Medical Record Librarianship
1216 Podiatry or Podiatric Medicine
1217 Biomedical Communication
1218 Veterinary Medicine
1219 Veterinary Medicine Specialties
1220 Speech Pathology and Audiology
1221 Chiropractic
1222 Clinical Social Work
1223 Medical Laboratory Technologies
1224 Dental Technologies
1225 Radiologic Technologies
1299 Other, Specify

1300 HOME ECONOMICS

1301 Home Economics, General
1302 Home Decoration and Home Equipment
1303 Clothing and Textiles
1304 Consumer Economics and Home Management
1305 Family Relations and Child Development
1306 Foods and Nutrition (include Dietetics)
1307 Institutional Management and Cafeteria Management
1399 Other, Specify

1400 LAW

1401 Law, General
1499 Other, Specify

1500 LETTERS

1501 English, General
1502 Literature, English
1503 Comparative Literature
1504 Classics
1505 Linguistics (include Phonetics, Semantics, and Philology)
1506 Speech, Debate, and Forensic Science (Rhetoric and Public Address)
1507 Creative Writing
1508 Teaching of English as a Foreign Language
1509 Philosophy
1510 Religious Studies (exclude Theological Professions)
1599 Other, Specify

1600 LIBRARY SCIENCE

1601 Library Science, General
1699 Other, Specify

1700 MATHEMATICS

1701 Mathematics, General
1702 Statistics, Mathematical and Theoretical
1703 Applied Mathematics
1799 Other, Specify

1800 MILITARY SCIENCES

1801 Military Science (Army)
1802 Naval Science (Navy, Marines)
1803 Aerospace Science (Air Force)
1899 Other, Specify

1900 PHYSICAL SCIENCES

1901 Physical Sciences, General
1902 Physics, General (exclude Biophysics)
1903 Molecular Physics
1904 Nuclear Physics
1905 Chemistry, General (exclude Biochemistry)
1906 Inorganic Chemistry
1907 Organic Chemistry
1908 Physical Chemistry
1909 Analytical Chemistry
1910 Pharmaceutical Chemistry
1911 Astronomy
1912 Astrophysics
1913 Atmospheric Sciences and Meteorology
1914 Geology
1915 Geochemistry
1916 Geophysics and Seismology
1917 Earth Sciences, General
1918 Paleontology
1919 Oceanography
1920 Metallurgy
1999 Other, Specify

2000 PSYCHOLOGY
2001 Psychology, General
2002 Experimental Psychology (animal and human)
2003 Clinical Psychology
2004 Psychology for Counseling
2005 Social Psychology
2006 Psychometrics
2007 Statistics in Psychology
2008 Industrial Psychology
2009 Developmental Psychology
2010 Physiological Psychology
2099 Other, Specify

2100 PUBLIC AFFAIRS AND SERVICES
2101 Community Services, General
2102 Public Administration
2103 Parks and Recreation Management
2104 Social Work and Helping Services (other than Clinical Social Work)
2105 Law Enforcement and Corrections
2106 International Public Service (other than Diplomatic Service)
2199 Other, Specify

2200 SOCIAL SCIENCES
2201 Social Sciences, General
2202 Anthropology
2203 Archeology
2204 Economics
2205 History
2206 Geography
2207 Political Science and Government
2208 Sociology
2209 Criminology
2210 International Relations
2211 Afro-American (Black Culture) Studies
2212 American Indian Cultural Studies
2213 Mexican-American Cultural Studies
2214 Urban Studies
2215 Demography
2299 Other, Specify

2300 THEOLOGY
2301 Theological Professions, General
2302 Religious Music
2303 Biblical Languages
2304 Religious Education
2399 Other, Specify

4900 INTERDISCIPLINARY STUDIES
4901 General Liberal Arts and Sciences
4902 Biological and Physical Sciences
4903 Humanities and Social Sciences
4904 Engineering and Other Disciplines
4999 Other, Specify

5000 BUSINESS AND COMMERCE TECHNOLOGIES
5001 Business and Commerce Technologies, General
5002 Accounting Technologies
5003 Banking and Finance Technologies
5004 Marketing, Distribution, Purchasing, Business, and Industrial Management Technologies
5005 Secretarial Technologies (include Office Machines Training)
5006 Personal Service Technologies (Stewardess, Cosmetologist, etc.)
5007 Photography Technologies
5008 Communications and Broadcasting Technologies (Radio/TV, Newspapers)
5009 Printing and Lithography Technologies
5010 Hotel and Restaurant Management Technologies
5011 Transportation and Public Utility Technologies
5012 Applied Arts, Graphic Arts, and Fine Arts Technologies (include advertising design)
5099 Other, Specify

5100 DATA PROCESSING TECHNOLOGIES
5101 Data Processing Technologies, General
5102 Key Punch Operator and Other Input Preparation Technologies
5103 Computer Programmer Technologies
5104 Computer Operator and Peripheral Equipment Operation Technologies
5105 Data Processing Equipment Maintenance Technologies
5199 Other, Specify

5200 HEALTH SERVICES AND PARAMEDICAL TECHNOLOGIES
5201 Health Services Assistant Technologies, General
5202 Dental Assistant Technologies
5203 Dental Hygiene Technologies
5204 Dental Laboratory Technologies
5205 Medical or Biological Laboratory Assistant Technologies
5206 Animal Laboratory Assistant Technologies
5207 Radiologic Technologies (X-Ray, etc.)
5208 Nursing, R.N. (less than 4-year program)
5209 Nursing, Practical (L.P.N. or L.V.N.—less than 4-year program)
5210 Occupational Therapy Technologies
5211 Surgical Technologies
5212 Optical Technologies (include Ocular Care, Ophthalmic, Optometric Technologies)
5213 Medical Record Technologies
5214 Medical Assistant and Medical Office Assistant Technologies
5215 Inhalation Therapy Technologies
5216 Psychiatric Technologies (include Mental Health Aide Programs)
5217 Electro Diagnostic Technologies (include E.K.G., E.E.G., etc.)
5218 Institutional Management Technologies (Rest Home, etc.)
5219 Physical Therapy Technologies
5299 Other, Specify

5300 MECHANICAL AND ENGINEERING TECHNOLOGIES
5301 Mechanical and Engineering Technologies, General
5302 Aeronautical and Aviation Technologies
5303 Engineering Graphics (Tool and Machine Drafting and Design)
5304 Architectural Drafting Technologies
5305 Chemical Technologies (include Plastics)
5306 Automotive Technologies
5307 Diesel Technologies
5308 Welding Technologies

5309 Civil Technologies (Surveying, Photogrammetry, etc.)
5310 Electronics and Machine Technologies (TV, Appliance, Office Machine Repair, etc.)
5311 Electromechanical Technologies
5312 Industrial Technologies
5313 Textile Technologies
5314 Instrumentation Technologies
5315 Mechanical Technologies
5316 Nuclear Technologies
5317 Construction and Building Technologies (Carpentry, Electrical Work, Plumbing, Sheet Metal, Air Conditioning, Heating, etc.)
5399 Other, Specify

5400 NATURAL SCIENCE TECHNOLOGIES

5401 Natural Science Technologies, General
5402 Agriculture Technologies (include Horticulture)
5403 Forestry and Wildlife Technologies (include Fisheries)
5404 Food Services Technologies
5405 Home Economics Technologies
5406 Marine and Oceanographic Technologies
5407 Laboratory Technologies, General
5408 Sanitation and Public Health Inspection Technologies (Environmental Health Technologies)
5499 Other, Specify

5500 PUBLIC SERVICE RELATED TECHNOLOGIES

5501 Public Service Technologies, General
5502 Bible Study or Religion-Related Occupations
5503 Education Technologies (Teacher Aide and 2-year Teacher Training Programs)
5504 Library Assistant Technologies
5505 Police, Law Enforcement, Corrections Technologies
5506 Recreation and Social Work Related Technologies
5507 Fire Control Technology
5508 Public Administration and Management Technologies
5599 Other, Specify

ALPHABETICAL LISTING

For the user's convenience, the HEGIS discipline subcategories are listed below in alphabetical order.

Part 1:

CONVENTIONAL ACADEMIC SUBDIVISIONS OF KNOWLEDGE AND TRAINING

Title	*Code*
Accounting	0502
Administration, business	0506
Administration, educational	0827
Administration, public	2102
Administration, special education	0809
Adult education	0807
Advertising	0604
Aeronautical engineering	0902
Aerospace engineering	0902
Aerospace science	1803
African languages (non-Semitic)	1116
African studies	0305
Afro-American studies	2211
Agricultural business	0112
Agricultural economics	0111
Agricultural engineering	0903
Agricultural management	0110
Agriculture, general	0101
Agriculture technologies	0116
Agronomy	0102
American Indian cultural studies	2212
American studies	0313
Analytical chemistry	1909
Anatomy	0412
Animal science	0104
Anthropology	2202
Applied design	1009
Applied mathematics	1703
Arabic	1112
Archeology	2203
Architectural engineering	0904
Architecture	0202
Architecture, naval	0923
Art	1002
Art appreciation	1003
Art, commercial	1009
Art education	0831
Art history	1003
Asian studies, general	0301
Astronautical engineering	0902
Astronomy	1911
Astrophysics	1912
Atmospheric sciences	1913
Audiology	1220
Bacteriology	0403
Banking	0504
Biblical languages	2303
Biochemistry	0414
Bioengineering	0905
Biological and physical sciences (interdisciplinary)	4902
Biology, cellular	0417
Biology, general	0401
Biology, marine	0418
Biology, molecular	0416
Biomedical communication	1217
Biomedical engineering	0905
Biometrics	0419
Biophysics	0415
Biostatistics	0419
Black culture studies	2211
Botany, general	0402
Business administration	0506
Business, agricultural	0112
Business economics	0517
Business education	0838
Business, general	0501
Business, international	0513
Business management	0506
Business statistics	0503
Cafeteria management	1307
Catalan	1199
Cell biology	0417
Cell physiology	0417
Ceramic engineering	0916
Ceramics	1009
Chemical engineering	0906
Chemistry, general	1905
Child development	1305
Chinese	1107
Chiropractic	1221
Cinematography	1010
City planning	0206
Civil engineering	0908
Classics	1504
Clinical psychology	2003
Clinical social work	1222
Clothing	1303
Commerce education	0838
Commerce, general	0501
Commercial art	1009
Communication media	0605
Communications, general	0601
Communications engineering	0909
Community college education	0806
Community planning	0206
Community services, general	2101
Comparative literature	1503
Computer programming	0704
Computer sciences, general	0701
Construction engineering	0908
Consumer economics	1304
Continuing education	0807
Corrections	2105
Counseling, educational	0826
Counseling, psychology for	2004
Creative writing	1507
Criminology	2209
Crop management	0102
Curriculum	0829
Cytology	0417
Dairy sciences	0105
Dance	1008
Danish	1114
Data processing	0703
Debate	1506

Demography	2215
Dental hygiene	1213
Dental specialties	1205
Dental technologies	1224
Dentistry, D.D.S. or D.M.D. degree	1204
Developmental psychology	2009
Dietetics	1306
Distributive education	0838
Dramatic arts	1007
Drawing	1002
Driver education	0836
Earth sciences, general	1917
East Asian studies	0302
Eastern European studies	0311
Ecology	0420
Economics	2204
Economics, agricultural	0111
Economics, business	0517
Education of the culturally disadvantaged	0813
Education of the deaf	0812
Education of the emotionally disturbed	0816
Education, general	0801
Education of the gifted	0811
Education of mentally retarded	0810
Education of the multiple handicapped	0820
Education of the physically handicapped	0819
Education, religious	2304
Education of the visually handicapped	0814
Educational administration	0827
Educational evaluation	0825
Educational measurement	0825
Educational psychology	0822
Educational research	0824
Educational statistics	0824
Educational supervision	0828
Educational testing	0825
Electrical engineering	0909
Electronics engineering	0909
Elementary education, general	0802
Embryology	0427
Engineering, general	0901
Engineering mechanics	0921
Engineering and other disciplines (interdisciplinary)	4904
Engineering physics	0919
Engineering technologies	0925
English as a foreign language	1508
English, general	1501
English, literature	1502
Entomology	0421
Environmental design, general	0201
Environmental engineering	0922
European studies, general	0310
Experimental psychology (animal and human)	2002
Family life education	0837
Family relations	1305
Farm management	0110
Fashion design	1009
Field crops	0102
Finance	0504
Fine arts, general	1001
Finnish	1199
Fish management	0107
Floriculture	0109
Foods and nutrition	1306
Food science	0113
Food technology	0113
Foreign languages, general	1101
Forensic science	1506
Forestry	0114
Forestry technologies	0116
French	1102
Fruit production	0108
Game management	0107
General liberal arts and sciences (interdisciplinary)	4901
Genetics	0422
Geochemistry	1915
Geography	2206
Geological engineering	0911
Geology	1914
Geophysical engineering	0912
Geophysics	1916
German	1103
Government	2207
Greek, classical	1110
Guidance, education	0826
Heatlh care administration	1202
Health education	0837
Health professions, general	1201
Hebrew	1111
Helping services	2104
Higher education, general	0805
Histology	0413
History	2205
History of education	0821
Home decoration	1302
Home economics, general	1301
Home equipment	1302
Home management	1304
Horticulture	0108
Hospital administration	1202
Hotel management	0508
Humanities and social sciences (interdisciplinary)	4903
Husbandry, animal	0104
Husbandry, dairy	0105
Ichthyology	0499
India studies	0303
Indian (Asiatic)	1113
Industrial arts education	0839
Industrial engineering	0913
Industrial psychology	2008
Industrial relations	0516
Information sciences	0702
Information sciences, general	0701
Information systems	0702
Inorganic chemistry	1906
Institutional management	1307
Instruction	0829
Insurance	0512
Interior decoration	1009
Interior design	0203
International business	0513
International public service	2106
International relations	2210
Investments	0505
Islamic studies	0306
Italian	1104

Japanese	1108
Jewelry	1009
Journalism	0602
Junior college education	0806
Junior high school education	0804
Kindergarten education	0823
Korean	1199
Labor relations	0516
Landscape architecture	0204
Latin	1109
Latin American studies	0308
Law enforcement	2105
Law, general	1401
Learning theory	0822
Liberal arts and sciences (interdisciplinary)	4901
Library science, general	1601
Limnology	0499
Linguistics	1505
Literature, comparative	1503
Literature, English	1502
Management, business	0506
Management, engineering	0913
Marine biology	0418
Marine engineering	0923
Marketing	0509
Materials engineering	0915
Mathematics, applied	1703
Mathematics, education	0833
Mathematics, general	1701
Mathematics, statistics	1702
Mechanical engineering	0910
Medical laboratory technologies	1223
Medical record librarianship	1215
Medical specialties	1207
Medicine, M.D. degree	1206
Metallurgical engineering	0914
Metallurgy	1920
Metalsmithing	1009
Meteorology	1913
Mexican-American cultural studies	2213
Microbiology	0411
Middle Eastern studies	0309
Military science	1801
Mineral engineering	0918
Mining engineering	0918
Molecular biology	0416
Molecular physics	1903
Music (liberal arts program)	1005
Music appreciation	1006
Music, composition	1004
Music education	0832
Music history	1006
Music, performing	1004
Music, theory	1004
Musicology	1006
Natural resources management	0115
Naval architecture	0923
Naval science	1802
Neurosciences	0425
Norwegian	1114
Nuclear engineering	0920
Nuclear physics	1904
Nursery science	0109
Nursing (baccalaureate and higher programs)	1203
Nutrition, scientific	0424
Occupational therapy	1208
Ocean engineering	0924
Oceanography	1919
Operations research	0507
Optometry	1209
Organic chemistry	1907
Ornamental horticulture	0109
Ornithology	0499
Osteopathic medicine, D.O. degree	1210
Pacific area studies	0314
Painting	1002
Paleontology	1918
Parasitology	0499
Park management	2103
Pathology, animal	0408
Pathology, human	0408
Pathology, plant	0404
Personnel management	0515
Petroleum engineering	0907
Petroleum refining	0906
Pharmaceutical chemistry	1910
Pharmacology, animal	0409
Pharmacology, human	0409
Pharmacology, plant	0405
Pharmacy	1211
Philology	1505
Philosophy	1509
Philosophy of education	0821
Phonetics	1505
Photography	1011
Physical chemistry	1908
Physical education	0835
Physical sciences, general	1901
Physical therapy	1212
Physics, general	1902
Physiological psychology	2010
Physiology, animal	0410
Physiology, human	0410
Physiology, plant	0406
Plant pathology	0404
Plant pharmacology	0405
Plant physiology	0406
Podiatry	1216
Political science	2207
Poultry science	0106
Pre-elementary education	0823
Programming, computer	0704
Psychology, clinical	2003
Psychology for counseling	2004
Psychology, developmental	2009
Psychology, education	0822
Psychology, general	2001
Psychology, industrial	2008
Psychology, physiological	2010
Psychology, social	2005
Psychometrics	2006
Public address	1506
Public administration	2102
Public health	1214
Public utilities	0510
Purchasing	0509

Radio	0603
Radiobiology	0423
Radiologic technologies	1225
Range management	0117
Reading education	0830
Real estate	0511
Recreation management	2103
Regional planning	0206
Rehabilitation services	1222
Religious education	2304
Religious music	2302
Religious studies	1510
Remedial education	0817
Restaurant management	0508
Rhetoric	1506
Russian	1106
Russian studies	0307
Safety education	0836
Sanitary engineering	0922
Sanskrit	1199
Scandinavian languages	1114
Science education	0834
Sculpture	1002
Secondary education, general	0803
Secretarial studies	0514
Securities	0505
Seismology	1916
Semantics	1505
Slavic languages (other than Russian)	1115
Slavic studies	0307
Social foundations of education	0821
Social sciences, general	2201
Social psychology	2005
Social work	2104
Sociology	2208
Soil conservation	0103
Soil management	0103
Soil science	0103
South Asian studies	0303
Southeast Asian studies	0304
Spanish	1105
Special education, general	0808
Special learning disabilities	0818
Speech	1506
Speech correction	0815
Speech pathology	1220
Statistics, mathematical and theoretical	1702
Statistics in psychology	2007
Student personnel	0826
Swedish	1114
Systems analysis	0705
Systems, information	0702
Teaching of English as a foreign language	1508
Technical education	0839
Television	0603
Textile design	1009
Textile engineering	0917
Textiles, home economics	1303
Theological professions, general	2301
Toxicology	0426
Transportation	0510
Transportation engineering	0908
Urban architecture	0205
Urban studies	2214
Vegetable production	0108
Veterinary medicine, D.V.M. degree	1218
Veterinary medicine specialties	1219
Vietnamese	1199
Vocational education	0839
Weaving	1009
West European studies	0312
Wildlife management	0107
Writing, creative	1507
Zoology, general	0407

Part II:

TECHNOLOGICAL AND OCCUPATIONAL CURRICULUMS LEADING TO ASSOCIATE DEGREES AND OTHER AWARDS BELOW THE BACCALAUREATE

Title	*Code*
Accounting technologies	5002
Advertising design technologies	5012
Advertising technologies	5004
Aeronautical technologies	5302
Agriculture technologies	5402
Air conditioning technologies	5317
Airport management technologies	5004
Animal laboratory assistant technologies	5206
Appliance repair technologies	5310
Applied arts technologies	5012
Architectural drafting technologies	5304
Automotive technologies	5306
Aviation technologies	5302
Banking technologies	5003
Bible study	5502
Biological laboratory assistant technologies	5205
Broadcasting technologies	5008
Building technologies	5317
Business management technologies	5004
Business technologies, general	5001
Carpentry technologies	5317
Chemical technologies	5305
Civil technologies	5309
Commerce technologies, general	5001
Communications technologies	5008
Computer operator technologies	5104
Computer, peripheral equipment operation technologies	5104
Computer programmer technologies	5103
Construction technologies	5317
Corrections technologies	5505
Cosmetologist	5006

Data processing equipment maintenance technologies	5105
Data processing technologies, general	5101
Dental assistant technologies	5202
Dental hygiene technologies	5203
Dental laboratory technologies	5204
Diesel technologies	5307
Distribution technologies	5004
Drafting, architectural	5304
Education technologies	5503
Electrician technologies	5317
Electro diagnostic technologies	5217
Electromechanical technologies	5311
Electronics and machine technologies	5310
Engineering graphics	5303
Engineering technologies, general	5301
Environmental health technologies	5408
Finance technologies	5003
Fine arts technologies	5012
Fire control technology	5507
Fisheries technologies	5403
Food services technologies	5404
Forestry technologies	5403
Graphic arts technologies	5012
Health services assistant technologies, general	5201
Heating technologies	5317
Home economics technologies	5405
Horticulture technologies	5402
Hospital food service technologies	5404
Hotel management technologies	5010
Industrial management technologies	5004
Industrial technologies	5312
Inhalation therapy technologies	5215
Input preparation technologies	5102
Institutional management technologies	5218
Instrumentation technologies	5314
Insurance technologies	5004
Key punch operator technologies	5102
Laboratory technologies, general	5407
Landscape technologies	5402
Law enforcement technologies	5505
Library assistant technologies	5504
Lithography technologies	5009
Machine drafting and design technologies	5303
Machine repair technologies	5310
Marina equipment technologies	5004
Marine technologies	5406
Marketing technologies	5004
Mechanical technologies	5315
Mechanical technologies, general	5301
Medical assistant technologies	5214
Medical laboratory assistant technologies	5205
Medical office assistant technologies	5214
Medical record technologies	5213
Mental health aide programs	5216
Natural science technologies, general	5401
Newspaper communication technologies	5008
Nuclear technologies	5316
Nursing, practical (L.P.N. or L.V.N.)	5209
Nursing R.N. preparation	5208
Occupational therapy technologies	5210
Oceanographic technologies	5406
Ocular care technologies	5212
Office machine repair technologies	5310
Office machine training	5005
Ophthalmic technologies	5212
Optical technologies	5212
Optometric technologies	5212
Personal service technologies	5006
Personnel management technologies	5004
Photogrammetry technologies	5309
Photography technologies	5007
Physical therapy technology	5219
Plastics technologies	5305
Plumbing technologies	5317
Police technologies	5505
Printing technologies	5009
Programmer technologies	5103
Psychiatric technologies	5216
Public administration and management technologies	5508
Public health inspection technologies	5408
Public service technologies, general	5501
Public utility technologies	5011
Purchasing technologies	5004
Radio broadcasting technologies	5008
Radio repair technologies	5310
Radiologic technologies	5207
Real estate technologies	5004
Recreation technologies	5506
Religion related occupations	5502
Rest home management technology	5218
Restaurant management technologies	5010
Sales technologies	5004
Sanitation technologies	5408
Secretarial technologies	5005
Sheet metal technologies	5317
Social work related technologies	5506
Stewardess preparation	5006
Surgical technologies	5211
Surveying technologies	5309
Teacher aide preparation	5503
Television broadcasting technologies	5008
Television repair technologies	5310
Textile technologies	5313
Tool design technologies	5303
Transportation technologies	5011
Welding technologies	5308
Wildlife technologies	5403
X-ray technologies	5207

APPENDIX D

Guidelines for Developing and Implementing Questionnaire Surveys

Guidelines for Developing and Implementing Questionnaire Surveys*

The need to develop and use questionnaire surveys for acquiring a wide range of information about the outcomes of postsecondary education is referenced throughout Sections II, III, and IV of the Outcome Measures and Procedures Manual. The purpose of this appendix is to provide a brief overview of the major steps to be taken in any questionnaire survey effort and to review some of the key questions that must be considered at each step. Incorporated in the discussion are some "how to do it" suggestions regarding such things as survey design, questionnaire construction, and report writing. It should be noted at the outset, however, that in no way does this appendix cover all the things there are to know about questionnaire survey development and implementation. Rather it is intended to serve as a reminder of the minimum requirements that are paramount in any survey effort.

Major Steps and Key Questions

Step 1: Establishing the Purpose of the Survey

As defined by A. N. Oppenheim (1973) a survey is a planned data collection effort for the purpose of description or prediction as a guide to action or for the purpose of explaining the relationships between two or more variables, e.g., the relationship between student academic achievement and student performance on a job. While most survey researchers will attest that in practice there are as many purposes as there are surveys, they also will agree that foremost in any survey effort is the development of a clear definition and understanding of the objectives of the survey. To achieve this end, it is essential that the first step to be taken in a survey is the delineation and clarification of the specific problems to be studied, the critical questions to be answered, and the possible uses to be made of the survey results. The reason this step is so central to every survey is the fact that once this initial step is accomplished, all of the remaining steps in the survey process are "means to an end" and will flow logically from the purpose of the study identified in this step.

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*From a paper by Sidney S. Micek, NCHEMS, 1975.

In establishing the purpose of the survey, it is important to obtain input from those persons who will use the findings from the study. Of course, the larger the group of persons from which input is sought, the greater will be the diversity of what may constitute the objectives of the study. Generally, the more objectives a study has to accomplish, the greater its complexity and cost. Therefore, it may be critical to set priorities as to the objectives that will be most important to achieve, given certain time and monetary constraints.

In addition to identifying the specific purposes or objectives of the survey in this initial step, two other key questions should be considered:

- What concepts need to be defined before the survey process continues? In the formulation of any survey effort, certain concepts are used to communicate and organize one's thinking relative to the problems or questions in focus. For example, in a survey of former students one question of interest might concern their satisfaction with their vocational preparation. What is meant by the concepts, "satisfaction" and "vocational preparation," in this context needs to be translated into specific terms so everyone clearly understands what constitutes the acceptable indicators of these concepts.

- What assumptions will be made?

  In many surveys it is impossible to control all elements of the survey, e.g., the validity of certain parts of a questionnaire or the adequacy of the sample. Therefore, formulating the assumptions of a survey is an important consideration since they may affect the survey process as well as the interpretation of the survey results.

Step 2: Developing the Survey Plan

Generally speaking, there are four basic purposes for which a survey is carried out:

1. To describe something,
2. To explain something,
3. To predict something, or
4. To explore something.

Very often surveys are designed to meet more than one of these objectives. For example, it is not uncommon to conduct a follow-up study of college graduates to obtain information about their current level of educational attainment and occupational status (i.e., description) and their educational needs now that they have left the institution (i.e., exploration). Once the purposes of the survey have been clearly delineated, the next key step is to develop the plan of action for conducting the study. The most appropriate is the one that ensures a logically tight and efficient plan so that clear answers to the questions or hypotheses of interest can be obtained.

In developing the survey plan the following key questions need to be considered:

- What will be the "units of analysis" under study?

  One of the first questions in laying the plans to be followed in a survey is to determine the "things" under study in the survey. Babbie in his book, Survey Research Methods (1973), has referred to the things under study in a given survey as the "units of analysis." The primary reason it is so important to identify the different units of analysis in a survey is that data will need to be collected to provide information about each unit of analysis identified. For example, a follow-up study of former students (graduates and nongraduates) might be aimed at acquiring information about (1) the marital status of the former students, (2) the salary level of former students who are heads of households, and (3) the mean annual combined income of former students' families. In these examples, the units of analysis would be, respectively, individual former students, former students who are heads of households, and former students' families. As Babbie (1974: 61) points out,

  > Whatever the nature of the data used to describe the units of analysis, it is important that they be identified in advance. Otherwise the sample design and the data collection methods may prohibit the analysis appropriate to the study.

- What types of survey design will be needed?

Having determined the purposes and the units of analysis for the study, the next key concern is selecting the design for the study. The best design is the one that arranges the conditions for data collection and analysis in such a way to "combine relevance to the research purpose with economy in procedure" (Selltiz, Jahoda, et al, 1951). As a result, survey designs will differ depending on the purposes of the study and the time and monetary constraints.

In determining the best design for a given survey, two basic types of design can be considered:

1. A Cross-Sectional Design--a plan for collecting data at a given point in time to describe, explain, predict, or explore certain aspects or relationships about a larger population at that point in time.
2. A Longitudinal Design--a plan for collecting and analyzing data over multiple points in time to describe, explain, predict, or explore changes in a given population over time.

There are variations to both of these basic designs that can be considered. For instance in a longitudinal study, a decision might have to be made about whether to study the same sample of a given group of students over time or to study different samples of a given group of students over time.

The references presented at the end of this appendix under the heading "Study Designs" provide extensive discussion about the strengths and weaknesses of different design alternatives.

- Should a sample be drawn?

A survey sample represents a subgroup of elements (e.g., a small group of students) that has been selected from a larger population (e.g., all the students enrolled in the college) for the purpose of finding out something about the population from which they have been taken. Most survey efforts in postsecondary education require some type of sampling. The reasons for this are threefold. Probably the most obvious reason is that it is less expensive to survey a sample of a large population. A second reason for sampling is that it saves a great deal of time in terms of data collection and data processing. The final major reason for sampling is that it is usually more efficient than a survey of the entire population since it allows for the development of higher quality instruments and the data collected are more manageable.

- What kind of sample should be selected?

Basically, two types of samples can be considered: (1) probability samples and (2) nonprobability samples. The important difference between these two types of samples is that probability samples are based on the use of random sampling in the selection of elements from the larger population.

In choosing between these two basic types of sampling approaches, one needs to assess the advantages and disadvantages of each. Probability samples are intended to avoid biases in the selection of the elements of the population by making sure all elements have an equal chance of selection. Such a guarantee allows the researcher to assume that the sample will closely resemble the population. A second advantage of probability samples is that they permit estimates of sampling error. Nonprobability samples, on the other hand, are apropos when probability sampling is too expensive or when it is impossible to apply the random selection process because the elements of the population cannot be enumerated.

Some important varieties of probability samples include simple random samples, stratified random samples, and cluster samples. Variations in nonprobability samples include quota samples and purposive samples. Detailed discussion about these sampling alternatives can be found in the references suggested under the heading "Survey Sampling" at the end of this appendix.

- How large should survey samples be?

While the size of a sample(s) depends on a number of factors, generally it should be large enough to obtain a sufficient number of responses to make some reliable conclusions. According to Kish (1965: 217):

> Exact control of sample size is unnecessary and impossible in most situations. It may be too difficult to obtain either the information or procedures for firmly controlling even the initial sample size. Moreover, nonresponses and subclasses introduce additional sources of variation. We should aim at an approximate control that is both feasible and desirable. The degree of control depends on the situation. . . .

Because the answer to this key question depends on the situation at hand, any further discussion here may be more confusing than helpful. As a result, one should consult the selected references on Sampling Methods presented at the end of this appendix.

Step 3: Developing the Survey Questionnaires

Because the use of self-report survey questionnaires is suggested so often throughout Sections II, III, and IV of the manual as the best means for collecting many of the outcomes measures listed therein, the following discussion focuses on key questions related to the development of this type of data-gathering instrument.*

- How should the questionnaire be designed?

  The format of any questionnaire should be attractive to the respondents. This is a most important ingredient in achieving a high response rate.

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*In-person or telephone interviews can also be useful in obtaining a wide range of outcome information. Their major limitation is that they are so time consumming. Two excellent references to review concerning this technique are:

1. Raymond L. Gordon, Interviewing: Strategy Techniques and Tactics. Homewood, Ill.: Dorsey Press, 1969.
2. Robert L. Kahn and Charles F. Connell, The Dynamics of Interviewing. New York: John Wiley and Sons, Inc., 1967.

The following is a list of suggestions for making a questionnaire attractive:

1. Keep the questionnaire as brief as possible.*
2. Use quality paper and printing whenever possible. Make sure the printing is not too small for the respondent to read.
3. Design the cover of the questionnaire so that it is distinctive, aesthetically appealing, and simple to read.
4. Make it easy for the respondents to record their answers.
5. Have a logical and easily followed order and organization of questions. For example, provide clear instructions when subsequent questions are contingent on an earlier question(s).
6. Present the questions so that plenty of "white space" shows between the items (don't clutter the questionnaire).

A final point to be considered in questionnaire design is how the questionnaire will be coded once it is returned. For example, if the responses are to be keypunched directly from the questionnaire, the developer will need to make sure the keypuncher can easily and reliably recognize the number or alphabetic character assigned to the questionnaire items and their associated response options.

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*In a situation where the number of questions to be asked of respondents is lengthy, one may want to consider giving parts of the questionnaire to different samples of the same population in order to keep reasonable the length of the questionnaire that anyone has to answer.

(A good rule to follow is have the draft of the questionnaire reviewed by a data processing expert to make sure it can be accurately keypunched.)

- Should open-ended or closed-ended items be used?

The decision about whether or not to use an open-ended item (in which the respondent supplies his or her own answer), a closed-ended item (in which the respondent selects his or her answers from the list supplied by the investigator), or both types will depend on the type that best serves the purpose(s) one has in mind. Whitney (1972) has listed the following advantages for each type of item.

The advantages of open-ended items are that they:

1. Are subject to little influence of the investigator.
2. Elicit a wide variety or responses.
3. Are useful for introducing subjects of new parts of the questionnaire.
4. Provide background for interpreting results.
5. Give respondents a chance to "have their say."
6. Are more "courteous."
7. Can aid in drafting questions and coding responses (when used in pilot work).
8. Give "sparkle" and credibility to your final report.

On the other hand, the advantages of closed-ended items are that they:

1. Are interperted more uniformly by respondents.
2. Produce easily tabulated responses.
3. Are unaffected by the respondent's verbosity.
4. Eliminate some problems of vocabulary and definitions.
5. Allow more questions to be asked.

- How should questionnaire items be worded?

The wording of questionnaire items is extremely important to ensure that the respondents will be willing to and capable of answering them in an honest and accurate way. This means that the items must be clear and unambiguous so the respondents understand exactly what the investigator wants to know. To achieve this objective, the following points should be considered:

1. To the extent possible, items should be kept short. Items that are too long often will cause the respondent to forget the purpose of the questions in focus. Further, lengthy items can cause fatigue and impatience among respondents which, in turn, may affect questionnaire reliability and response rate.
2. In writing the items, keep the language simple, clear, and straightforward. A good rule to follow is write the item so that the respondent feels you are treating him or her with respect and courtesy.

3. To the extent possible, items should be stated in the form of simple sentences rather than in the form of compound or complex sentences.

4. Caution should be taken to avoid biased words or phrases that may influence a respondent to answer one way or another.

5. If questionnaire items offer alternative responses to be checked by the respondent, the set of responses should include all possible and distinct responses to the question in focus to avoid confusion (i.e., the set of responses should be exhaustive and mutually exclusive).

6. The need to avoid "double-barreled" questions is another important consideration in item wording. For example, asking respondents to agree or disagree with statements such as "Micro University should continue to strive for excellence in the liberal arts and excellence in its career-oriented programs" should be avoided. Some persons may not be able to respond because they might favor an emphasis in the liberal arts curriculum but be violently opposed to any career-oriented curricula or vice versa. Furthermore, if they did answer, the responses of such persons would be misleading. Babbie (1973: 142) suggests that whenever the word "and" appears in a questionnaire item, the item should be checked to determine if it is a double-barreled one.

In developing the questionnaire items included in the Outcome Measures and Procedures Manual, these guidelines have been taken into consideration.

However, as modifications are made to these items or new questions are added, the guidelines pertaining to question wording should be reviewed.

- How should the items be sequenced?

The sequence in which questions appear on a questionnaire is always significant since it not only adds to the attractiveness of the instrument but also sets the tone for responding to the questionnaire. As a general rule of thumb it is suggested that a questionnaire should begin with a set of questions that will be most interesting to the respondent. That is, they should make the respondent want to answer them. Often questions concerning attitudes and satisfaction can serve this purpose, while questions regarding demographic variables will not.

A second rule to follow in the sequencing of items is to group the items that deal with the same topic.* For example, on a former student questionnaire, questions concerning educational progress and plans could be one grouping and questions about occupational status and plans could be another grouping.

A final consideration concerning item sequencing is that some people feel that items which are more difficult to answer should be toward the end of the questionnaire unless they are crucial for setting the tone or introducing the substance of the questionnaire.

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*After this rule has been considered, it might be good also to group according to item format type, e.g., all items on a particular topic that are "sentence-completion" should be grouped together.

- What kinds of instructions should be included in the questionnaire?

The instructions contained in a questionnaire are especially important for directing the respondent through the body of the questionnaire and for establishing and maintaining rapport with the respondent. Instructions within the questionnaire also will help the respondent understand the purpose of the order of questions and make more sense out of the questionnaire as a whole. For example, in introducing a series of questions that are designed to determine students' job career plans, it can be beneficial to preface the series with the statement:

> "The following four questions are intended to help us learn about your current and long-range occupational career plans and activities."

- What kind of introductory cover letter should accompany the questionnaire?

The letter that accompanies the questionnaire is also important for establishing rapport since it serves to introduce the total survey and its purpose. Very often the introductory letter is the key device that motivates the respondent to complete the questionnaire. Generally, the more personal you can make the cover letter, the greater will be your chances of achieving a high response rate.

- What pilot testing of the questionnaire will be conducted?

Ideally, a pilot test (preliminary tryout) of the total survey should be conducted. Such a pilot test would include testing the sample design, the questionnaire, the data gathering and processing procedures, and the data analysis to be carried out. At a minimum, a pilot test of the questionnaire to be used in the study should be conducted. Furthermore, the pilot version of the questionnaire should be to the extent possible an exact replica of the questionnaire that is intended for the actual study. If a final version of the questionnaire has not been decided on, then alternative questionnaires should be tried out on different pilot samples. In this way, pilot test respondents will be reacting to the version that is likely to become the final instrument.

Step 4: Collecting and Processing the Survey Data

This major step involves the administration (assembly and distribution) of the questionnaires and what should be done with them once they are returned. Key questions associated with this step are the following:

- How will the questionnaire and its accompanying materials be assembled and distributed?

  In conducting a self-report questionnaire survey, special attention must be given to the distribution and collection of the questionnaires for the purpose of ensuring a high response rate. The method for administering a questionnaire that most often is employed involves the assembly of (1) the questionnaire, (2) an introductory letter, and (3) a return postage-paid envelope. An alternative method is the development of a self-mailing questionnaire that requires no return envelope. This type of questionnaire is constructed in such a way that the return address and postage are printed on the questionnaire, and, therefore, the respondent can return it without the use of an envelope. (See alternative #3 for Outcome Measure I-8 in Section IV of this manual for an example of this latter alternative.)

A major drawback of this latter method is that it may place too much responsibility on the respondent who may not be willing to spend a great deal of time in prèparing the questionnaire for its return (e.g., using a stapler to seal the questionnaire). Also, special post office requirements concerning the size and form of materials that can be mailed may cause unforeseen problems. Possibly the best suggestion that can be given is that no matter which method is used, you should assess what approach will be most accpetable to the respondents and also will meet the requirements of the postal authorities.

It should be noted that for surveys of current students and faculty/staff, non-mail methods may be appropriate for distributing self-report questionnaires. For example, questionnaires can be administered to faculty at faculty meetings, to current students at the end of a class or in their living units, and to graduating students when they register for graduation. The major advantage of this method is that if offers greater control over questionnaire response rate and allows for oral clarifying information to be provided to the respondents. A problem can arise with this method if the respondents feel they are being hurried or imposed upon. Therefore, it is important to sure the respondents do not feel they are being forced in any way to complete the questionnaire.

- How will the returned questionnaires be monitored?

The monitoring of returned questionnaires is another major concern in carrying out a survey since it sets the stage for data processing and, subsequently, data analysis. The following strategy has been suggested by Babbie (1973) for dealing with this issue:

> First, prepare two return-rate tables. The first table should identify the number of questionnaires returned each day from Day 1 (the date the questionnaires are mailed) to the day that is the designated cutoff date for returned questionnaires. The second table should identify the cumulative number or percentage of the questionnaires that were returned. Again, start with the day the questionnaires were mailed as Day 1 and end with the designated cutoff date for the returned questionnaires. The advantages of these two tables are that (a) they allow you to keep track of response rate to the mailed questionnaires, (b) they provide ready-made tables that could be included in the study report, and (c) they identify the size of the follow-up mailing that will be necessary.
>
> Once the two return-rate tables have been prepared, assign identification numbers to each of the questionnaires as they are returned. These identification numbers should be assigned serially. Such numbers can be valuable in estimating non-response biases in the survey. Babbie (1973) presented the

following example to illustrate the utility of using these numbers:

> If grade-point average (GPA) reported by students decrease steadily through the data collection, with those replying right away having higher GPA's and those replying later having lower GPA's, then the research might tentatively conclude that those who failed to answer at all have lower GPA's yet.

In giving this example Babbie cautions, "While it would not be advisable to make statistical estimates of bias in this fashion, the researcher could take advantage of approximate estimates."

- What follow-up procedure needs to be used?

Everything that has been suggested up to now concerning the development and administration of survey questionnaires has focused on the objective to obtain an acceptable response rate. However, almost every survey, no matter how carefully it has been planned and the materials have been developed, needs a follow-up design. The primary reason for this is that a high response rate ensures that the sample of actual respondents approximates the larger population and, therefore, valid conclusions can be made about the findings.

Generally, the follow-up design will call for the use of (1) a reminder letter or postcard, (2) a follow-up letter and a questionnaire, (3) a telephone follow-up, or (4) combinations of these three techniques. The exact follow-up procedure selected will depend on the situation at hand. However, several general suggestions are important to keep in mind:

1. Make sure the follow-up is properly timed. Usually, there is a two week interval between the initial contact and the follow-up contact.

2. Make sure the nonrespondents can be identified at each stage of the follow-up. One way that has been found useful in keeping track of nonrespondents in mail surveys is to produce three sets of stick-on address labels. The first set can be used for the first mailing. When questionnaires are returned, the address label for the respondent can be removed from the second set of labels and placed on the questionnaire for identification purposes. Then when the follow-up mailing is scheduled, the remaining labels of the second set can be used to address the envelopes or postcards. The third set is then used to identify those who return questionnaires after the follow-up mailing and those who do not.
3. Develop a return-rate graph to assess the effects of the initial contact and subsequent follow-up contacts.

- What will be an acceptable response rate?

As mentioned above, an acceptable response rate is important so valid conclusions can be made about the results. In mail surveys related to postsecondary education, response rates vary from 30 to 80 percent depending on the type of respondents. For example, a much lower response rate can be expected in dropout studies than in other kinds of outcome studies.

A common procedure for computing the response rate is as follows:

1. Identify the initial size of the sample.
2. Subtract the number of persons in the initial sample who did not receive questionnaires from the total number of persons in the initial sample.

3. Divide the number of persons who returned completed questionnaires by the net number who received questionnaires. The percentage that is obtained identifies how successful the survey was in getting people to participate.

For those persons who did not respond, it is always a good idea to check if there was a response bias (i.e., to determine if only a certain type of person responded or did not respond).

- How should the data be processed?

  This question focuses on how the data will be coded, edited, formatted, and eventually stored (filed). Because of the importance of these considerations and the confusion that often surrounds them, a detailed discussion of a set of rules in this area is presented in Appendix E.

Step 5: Analyzing the Survey Data

This step is designed to determine what the data collected in the survey actually mean. The following two key questions need to be considered in this step:

- What statistical techniques are needed to analyze the data?

  The overall purpose of statistical analysis is to link the data back to the questions or hypotheses that motivated the study in the first place. In analyzing survey data, two basic types of statistical treatments of the data can be employed: (1) descriptive statistics and (2) inferential statistics. Descriptive statistics are appropriate when there is an interest in an accurate description or picture of the data. Generally, three methods can be used to achieve this objective:

1. Description of the distribution of the data through the use of frequency distributions and percentages.
2. Description of the central tendency of the data through the use of means, medians, and modes.
3. Description of the variability of the data through the use of standard deviations and ranges between the data.

Inferential statistics should be applied when the questions or hypotheses of the study call for drawing inferences or testing conclusions, or generalizing about the data. According to Hillway (1969) inferential statistics are intended to answer questions like the following:

- What is the probable accuracy (i.e., reliability) of the measurements?
- To what extent does the situation described by the data differ from what might be arrived at through mere chance?
- To what extent is there a relationship between two or more factors or variables dealt with in the study?

Useful guides for selecting the appropriate statistical methods to be applied in a study have been prepared by Tatsuoka and Tiedeman in N.L. Gage's Handbook of Research on Teaching (1963) and by Siegel in his book on Nonparametric Statistics for the Behavioral Sciences (1966).

- Will a statistical computer program be used to analyze the data?

A variety of statistical computer program packages have been developed to aid researchers in the analysis of large amounts of data. Three of the more well-known statistical packages used in analyzing survey-type data are:

1. SPSS--Statistical Package for the Social Sciences by N.H. Nie, D.H. Bent, and C.H. Hull, McGraw-Hill Book Co., New York, 1975.
2. BMD--Biomedical Computer Programs by W.J. Dixon (Ed.), University of California Press, Berkeley, 1973.
3. OSIRIS III by Survey Research Center ISR, University of Michigan, Ann Arbor, 1973.

When considering the use of these statistical packages it is important to keep in mind: (1) their ease of use, (2) their availability to the researcher, and (3) the availability of the specific statistical analytic techniques in the statistical package.

Step 6: Reporting the Survey Results

This step is intended to help communicate the survey findings in a logical, clear, and accurate form. In short, it is the step in which the data are finally prepared in a form that they can be used in the decision-making process. Key questions to be considered in this step include the following:

- Who will read and use the report?

  Having a clear understanding of who will read the survey report is extremely important for effectively communicating the results of the study. Very often different audiences will be interested in the findings. As a result, drafts of the survey report will have to be appropriate for different levels of interest in the report and different levels of sophistication among the various readers.

- Will there be more than one report?

In many cases a variety of reports will need to be developed that vary in form (oral and written) and length. For example, a lengthy written report that describes the study procedures followed and presents the findings in detail will probably need to be prepared for the sponsor of the research. Often a shorter, more compact version of the full report will be needed to summarize the study and its findings for those persons who do not have time to read the full report and who are less interested in the various nuances and details of the study.* This shorter version of the report will quite often be more widely read and quoted. Therefore, it is important to select carefully the critical aspects of the study to be communicated in the report and to do so in a form that is attractive and easy to understand.

- What tables, charts, and figures will be most useful in communicating the results of the study?

Much thought should be given to how the data and results of the statistical analysis will be communicated in the reports. In choosing the types of tables, charts, graphs, and so forth to be used, it is a good idea to consider how familiar the audience is with statistical concepts and presentations. Also it is good to remember that "a picture is worth a thousand words" if it is a good one. (A good reference on characteristics of tables, charts, and figures can be found on pages 38-53 of Glass and Stanley's book, Statistical Methods in Education and Psychology, 1970.)

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*For survey findings to have maximum impact, it will also be desirable to prepare even shorter special reports for groups of decision makers having different concerns. The reports prepared for particular decision makers should focus only on those findings of importance to them.

- When will the report be needed?

Although this is the last key question presented in this appendix, it is equally, if not more, important than all the other questions. Survey efforts are usually undertaken in postsecondary education institutions to provide information for decision-making purposes. As a result, if the report is not available when it is needed, then all the time and energy that has been put into it has gone for naught. For this reason, it is important in planning the survey to develop an activity-time flow chart that specifies when each milestone has to be met.

A Final Comment

Obviously, the discussion presented in this appendix provides only a thumbnail sketch of the major steps and key questions to be considered in the questionnaire survey process. It is hoped, however, that comments and suggestions which have been made about these steps and questions will serve as a set of minimum guidelines for ensuring the appropriate and useful application of the data collection procedures presented in this manual.

To aid in further inquiry about the various components of the survey process mentioned in this appendix, a set of selected references follows.

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APPENDIX E

A Reprint of

A HANDBOOK OF DATA PROCESSING GUIDELINES:
CODING, FORMATTING, EDITING, DOCUMENTING, AND STORING DATA

by

Cathleen Bower

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INTRODUCTION

Most data collection efforts proceed through several major stages: a design or planning phase, a collection or implementation phase, an analysis phase, and finally, a report-writing phase. Frequently, little attention is paid to the development of sensible coding and data formatting rules. It is the contention of this author that a considerable amount of money and effort could be saved on many data collection projects by the application of a few common-sense rules or guidelines for transcribing the data from raw response form to computer readable cards or tape.

The intent of this handbook is to provide some rules or guidelines for those involved in the processing of data in preparation for computer analysis. (Some of the rules relate primarily to the problems associated with survey or questionnaire data, but most are simply standard, common-sense procedures applicable to the processing of any input documents.) Throughout the handbook, several central themes are expressed:

- The loss of information should be minimized between the raw document and the computerized form of the document.
- Errors in transcribing the data should be minimized.
- The programmer's problems in working with the data should be minimized. (This does not mean that the number of programs should necessarily be minimized, but that decoding, subscripting, formatting, and other data handling problems should be kept to a minimum.)

- The number of decision by coders and keypunchers should be minimized; i.e., any data manipulation that can be done on the computer should not be done by hand.

This handbook is not intended as a guide to good questionnaire design, although many of the suggestions given here are related to questionnaire design and should be taken into account when planning the instrument. Neither is this handbook concerned explicitly with data analysis, though, again, there should be an interaction between data analysis and data transcription considerations.

There are numerous examples of time and money lost because of poor coding schemes, both in very large data collection efforts and in small one-person efforts. The guidelines which follow in this paper are an attempt to present some common-sense rules to use in coding data, deciding on a format for the data, and editing, storing, and documenting the data for further use. Adherence to these guidelines should insure that the data will never have to be repunched and that what *is* punched will be a complete and accurate representation of the raw data.

This paper is organized into four sections: (a) coding guidelines; (b) data formatting guidelines; (c) keypunching and editing guidelines; and (d) documentation and data storage guidelines. Within each section, a number of rules are included for insuring proper data transcription. Each rule is accompanied by a rationale explaining its purpose. Where appropriate, examples are included and in some cases, exceptions to the rule.

Guidelines for Coding Data

1. Rule: Do not assign a code of zero to responses, particularly categorical responses (see two exceptions below).

Rationale: Many computer languages cannot distinguish between zeroes and blanks; thus, special machine language programs may be required for this purpose. Also, package programs (e.g., SPSS, BMD) frequently have been written to accept categorical data input as integers beginning with "1". Finally, most computer languages do not allow a subscript of zero; thus, the programmer must remember to add "one" to all categorical variables that can have a value of zero before using the variable as a subscript.

Example: The two responses YES/NO should be coded 1 = Yes and 2 = No or vice versa, not 0 = Yes, 1 = No.

Exceptions: Assign a value of zero to a continuous variable that has a natural zero point (i.e., the number zero indicates the absence of any quantity of the variable). An example of a questionnaire item for which a code of zero makes sense is the number of visits to a doctor in the past week. The other exception to Rule 1 is in scoring tests with right and wrong answers. Traditionally a wrong answer is coded zero and a correct answer coded as a "1", though there is no compelling reason for this coding scheme.

2. Rule: Assign numeric codes to categories; do not use alphabetic codes to indicate responses to variables.

Rationale: Computers operate on numbers: any alphabetic codes must first be translated into numbers before being tabulated, used as subscripts, or arithmetically manipulated. It is easier and less costly in the long run to have numbers translated into the alphabetic code they represent (when necessary for labelling purposes) than to translate alphabetic codes into numeric codes.

Example: The two responses YES/NO should be coded 1 = Yes and 2 = No, not Y = Yes and N = No.

Exceptions: Information for printing, labelling, or addressing purposes such as name of respondent, address, etc., can and should be stored as alphanumeric characters. A variable such as home state of respondent should be punched as a number if any tabulations will be performed using that variable for grouping purposes.

3. Rule: Missing data values (the response left blank) should be coded as blanks (the card left blank in appropriate columns).

Rationale: Most packaged programs are designed to eliminate missing data (coded as blanks) from computations at the option of the user. The use of a missing value code other than a blank will require extra cards or statements in running these programs. It also makes good sense to try to code the data for computer usage exactly like the original raw data as much as possible.

Example: A missing achievement test score for a student respondent should be left blank on the appropriate card or tape columns; the card columns should not be filled with zeroes or some other missing value code such as 999.

4. Rule: Don't punch or code decimal points (or other punctuation such as "$", commas, etc.).

Rationale: This rule has a number of justifications: (a) computers do not use punctuation (except the decimal point) such as "$" or commas; therefore, extra programming is required if any punctuation is punched; (b) decimal points are acceptable as computer input but not required; since decimal points take up extra space on the card, require extra time to punch, and can be indicated easily at the time of execution of the program, it is not recommended that they be punched. Also, it sometimes is necessary to move the decimal point in a number for analysis in a particular program (if the program has a maximum or minimum range for variables); this can easily be accomplished if the decimal is not punched, but requires a special data transgeneration step if the decimal has been punched.

Example: Data such as 98.112, 31.006 should be coded and punched as 98112, 31006. Data such as $21,340.31 should be punched simply as 2134031.

5. Rule: Don't change uncategorized data into categories, combine one or more responses into one code, or collapse categories of responses into smaller number of categories at the time of coding or punching.

Rationale: It is not difficult in a computer program to combine or aggregate responses from cards or tapes. It can be costly and time consuming, however, for a future user of the data or the current user to decide that the unaggregated or uncombined responses are necessary to analyze the data properly and, therefore, have to recode and repunch some of the data. There is also a greater possibility of error in the punched cards or tape if a coder or keypuncher is asked to mentally combine or transcribe responses while recording or punching them.

Example: A questionnaire item with the fourth and fifth responses listed as "not applicable" and "don't know," respectively, should be coded separately as "4" and "5", even if the current analysis plans are to combine the two responses. Another example is an item that asks for the respondent's annual salary. Even if it is planned that only three categories of salary will be used for analysis (e.g., high, middle, and low), the original salary or categories of salary should be coded and punched.

6. Rule: Use identical codes for all items in a questionnaire with the same responses.

Rationale: It will be easier for all persons working with the data to remember the numeric codes for responses if there is uniformity throughout the questionnaire or document to be punched.

Example: Throughout the questionnaire or document, code Yes/No as 1 = Y, 2 = N (or vice versa, although 1 = Y, 2 = N is probably easier to remember). This rule applies particularly when most items on a questionnaire list "yes" as the first response, followed by "no", but a few items list these two responses in reverse order. The rule also applies in the case where some of the items have an additional category such as "don't know" which should be assigned a code value of "3", even though "don't know" may be listed as the first response.

Exceptions: If a questionnaire contains several Yes/No responses and some items with an additional category such as "uncertain," that logically falls between "yes" and "no", it is better to code 1 = Y, 2 = U, 3 = N. The rationale for this exception is that the response "uncertain" is logically between the responses "yes" and "no" on a scale of how certain the respondent is about the question asked. This exception does not imply that other items in the questionnaire or document with only two responses (YES/NO) should then be coded 1 = Y, 3 = N (see rule 8). As is explained in the next rule, it is important that numeric codes correspond to any underlying scale in the responses.

7. Rule: Numeric codes for categorical responses should correspond to implicit ordering of the responses.

Rationale: Frequently, statistics such as the mean and standard deviation are required for categorical variables that have some underlying continuum. If the numeric codes for the categories have been assigned and punched logically (i.e., according to the implicit ordering of the responses), no recoding will be necessary to compute such statistics. It is also easier to remember the meaning of numeric codes for categories if they have been assigned according to a logical ordering scheme.

Example: Responses to an item on a questionnaire might be (a) high, (b) low, and (c) in-between. According to rule seven, the numeric codes assigned should be Low = 1, In-between = 2, and High = 3. Thus, the low category is assigned a low number, and also the assigned numbers correspond to the implicit ranking of the categories.

Note: If the questionnaire has been written as described in the above example, neither the coder nor the keypuncher should be asked to perform the rearrangement of the codes to correspond to the implicit ranking of the categories; rather, a simple transgeneration computer program should be run to assign the number codes to the proper responses. The coder or keypuncher should simply code or punch 1 = high, 2 = low, and 3 = in-between so that transcription errors will be minimized.

8. Rule: Code values assigned to response categories should be consecutive integers ranging from "1" to K, where K is the number of categories.

Rationale: For most computing purposes, computations, cost, time, and confusion will be minimized by assigning consecutive integer values to categorical responses. See also the rationale for rule 2.

Example: For a questionnaire item with three possible responses: (a) never, (b) three times a week, and (c) six times a week, assign codes of one, two, and three rather than zero, three, and six to the responses.

9. Rule: Where possible, assign standard codes to questionnaire responses.

Rationale: The use of standard codes (where they exist) will facilitate any comparisons between the analytic results of the current study with past and future studies using the same data items.

Example: A data item for which numeric codes are needed might be the state in which the respondent lives. Clearly, every data collection effort in which this information is gathered could assign codes from one to 51 to the various states in the United States, but a more sensible approach is for all data collectors to use the same codes. Thus, one should search through previous literature or other sources to find an existing coding system for states in the U. S. Other examples are the coding of occupation, education, ethnic group, college major field, etc.

Guidelines for Formatting Data

10. Rule: Always assign a numeric identification (ID) number and sequence number to every card in the data set so that each card has a unique number identifying its sequence.

Rationale: There are several reasons for this rule: (a) if the cards get dropped, or out of sequence, ID numbers and card sequence numbers on each card make it easy to put the cards back in their proper order; (b) For some purpose, it may be necessary to create a file of, say, the fifth card for each respondent; (c) Supplementary data may need to be merged with each respondent's previous data.

Example: A questionnaire administered to 1300 respondents might require 149 card columns to punch all the responses. Four-digit ID numbers should be assigned to all persons and punched on all cards, and (since two cards will be required per respondent) card numbers (one and two) should be assigned and punched on each card. Thus, the card sequences should look like: 10011, 10012, 10021, 10022, etc.

Note: (a) ID numbers are often assigned beginning with 101, 1001, rather than 001, 0001, etc. This practice is generally a good one in that it sometimes requires extra programming effort to print ID numbers with leading zeroes (i.e., "001" will usually be printed as "1" by the computer). Keypunchers, also, must be instructed to punch leading zeroes. Beginning the ID numbers with a "1" eliminates this problem. (b) It is generally a good idea to include a sequence number in the format, even if there is only one card per respondent, to facilitate adding additional cards for each respondent in the future.

11. Rule: The ID number should be the first set of data on each card, followed by card or sequence numbers (within ID numbers), followed by frequently used respondent information, with data responses appearing last on the card(s).

Rationale: This rule is based partly on tradition and partly on experience. Since the ID number and card numbers are frequently used pieces of information, placing them first on each card saves time for the data user or programmer. The same reasoning follows for such information as sex, ethnic origin, curriculum, grade level, and other common grouping variables. If a number of computer runs are to be made, particularly on lengthy data records (several cards per respondent), it is easier for everyone involved in the analysis or programming to look for commonly used information on the first card, rather than having to find respondent's sex on card two in column 59 and respondent's grade level on card five, column 31, etc. Hopefully, the questionnaire or data gathering instrument has also been organized with important categorical variables listed first.

Note: As in the note with rule 7, if the questionnaire has not been organized as described in this rule, do not ask the coder or keypuncher to perform the rearranging of the data. A separate program should be run after the keypunching stage to accomplish this.

12. Rule: The data format or lay-out should be organized in the same order as the questionnaire responses except where a conflict exists with rule 11.

Rationale: If the punched data format is in the same order as the raw data, it will facilitate the process of referring back and forth between the data gathering instrument and the data format.

Example: The format for a questionnaire with three parts should be arranged so that responses to the three sections are in the same order in both. Responses should also be in the same order on both documents within sections of the questionnaire.

Exceptions: Rule 11 should supercede this rule where there is a conflict between the two guidelines; i.e., if the questionnaire has been arranged such that certain important grouping variables (such as sex of respondent, grade level, etc.) are buried in the middle of the questionnaire, it is better to place them toward the beginning of the format, out of the order in which they were placed on the questionnaire.

13. Rule: A data field, such as card sequence number or ID number, which appears on every card per respondent should be located in the same columns on each card.

Rationale: A data field, such as ID number or card number, that must be examined across cards (either by hand, using the card sorter, or in a program), is extremely difficult to work with or use if it is not punched in the same columns on every card.

Example: If the ID number on card one is 1332 in columns one through four, then card two should also contain the ID number in columns one through four and similarly for the card sequence number in column five of both cards; e.g., columns 1-5 of card 1 should contain 13321, and card 2, 13322.

14. **Rule:** In general, card columns should be filled, starting with column one, without spaces (blank columns) between the variables.

Rationale: This rule is more of a guideline than a rule, and the user must decide whether to follow it or not. There are two reasons for following this rule: (a) inserting extra blank columns between variables may mean that more cards per respondent are necessary than the minimum required by contiguous, consecutive data. (This situation is particularly a problem if two cards per respondent are required rather than just one, since one card per respondent is much easier to deal with than two or more.) (b) If new data are ever added to the original, it is easier to add them to the remaining right-most columns of the card format, than to add another card to the format or change the card format and compress the original variables together.

Exception: When sight verifying of the cards is planned or there are very few variables, separating variables by one or two blank columns can be helpful for distinguishing fields.

15. **Rule:** Never assign more than one response to each column or position in the data format.

Rationale: Multiple punches in the same column always require specially written decoding programs to read the data. Any savings in formatting space gained by multiple punching will be lost in time and money required to read multiple punched data.

Example: A questionnaire item requesting the respondent to "circle three choices" should be formatted with three columns, one for each possible choice of the respondent.

Guidelines for Keypunching and Editing Data

16. Rule: When sending cards to be keypunched or keytaped, request that the cards be verified.

Rationale: Verifying cards or tapes costs about twice as much as simply having the cards punched but helps insure greater punching accuracy.

Exceptions: If, for some reason, a small number of punching errors are acceptable, or if the number of cards to be punched is few enough that a sight check of accuracy can be performed, card or keytape verification is unnecessary.

17. Rule: When giving the data to the coder or keypuncher, include very specific and precise instructions about the format

and the coding scheme. Instruct the coder or keypuncher to call or ask about any questions he/she has and to set aside those documents about which there are unanswered questions.

Rationale: Frequently, questions arise during the coding or punching phase about which the data user must make decisions and must be aware. Without specific instructions to call about questions, some keypunchers and coders will simply make their own decision and continue.

18. Rule: Before setting up a data format and deciding on coding schemes, examine the responses to a few of the returned questionnaires.

Rationale: Very often unusual or unexpected responses appear, particularly on questionnaires; examination of a few returned questionnaires before designing a format or setting up coding schemes will help insure that the "strange" responses can be accommodated by the data format and response codes.

19. Rule : Before finalizing the plans for the format and code values for the data, discuss both with someone who is familiar with the kind of analysis programs that are or may be required.

Rationale: A data processing person (may be a research assistant, programmer, systems analyst, etc.) can often spot potential problem areas in either the format for the data or in particular choices for coding responses.

20. Rule: Always make some kind of data editing check as the first step after the punched cards or keytape have been returned.

Rationale: Without fail, some errors will occur in the process of transcribing raw data to tape or cards; therefore, at a minimum, before doing any analysis, a computer run should be made that prints out-of-range responses for all variables and checks for duplicate ID numbers and card numbers. (If the number of cards is small, the editing check can be done by hand.) Examination of this output should point out errors where the data were out of the acceptable or reasonable range and where ID numbers were mispunched. Other errors, such as coding or keypunching errors where digits are reversed or mispunched within the acceptable range are harder to find: (a) If the data set warrants the procedure, there are a number of schemes for creating "check digits" to detect certain types of transcribing errors; (b) One can also check by hand a random sampling of questionnaires against the corresponding punched cards or tape records to estimate the error rate for all questionnaires, and simply report these values in the summary document for the study.

Note: Data transgeneration or rearrangement tasks (see rules 7 and 11) can be combined with the data editing run so that all three are accomplished in one program.

21. Rule: Edit the entire data field for a variable; do not edit each column separately within the data field.

Rationale: Fewer errors will occur and less editing checks will be required if each variable is edited as a field.

Example: The variable, SAT verbal score (range 200 - 800), should be edited as one field to check for scores less than 200 or greater than 800. This variable should not be edited as three columns, the first ranging from two to eight and the second and third ranging from zero to nine.

22. Rule: As a general rule, numbers should be punched right-justified and alphabetic characters punched left-justified.

Rationale: The term right-justified means that the data are punched all the way to the right in the field (e.g., if columns 21 through 23 contain a code for curriculum, then curriculum code "1" will be punched as bb1 rather than 1bb, "where "b" means a blank column). Left-justified is the reverse of right-justified (i.e., the name "Jones" in an eight column name field would be punched "JONESbbb" instead of bbbJONES"). Alphabetic characters are normally used for printing and labelling purposes where it makes sense to punch the data as we read, from left to right. Numbers, on the other hand, are usually used for computations, in which case it makes sense to punch them the way we would write them to add up a column of figures. Also, "1bb" would be read by the computer as "100" without special instructions to the contrary.

23. Rule: As a general rule, request that the keypuncher precede numeric fields with zeroes (zero-fill) when the number to be punched does not fill up the entire field.

Rationale: Keypunching accuracy, rhythm, and speed will be increased if each field requires the same number of punches for all respondents.

Note: Alphabetic or character fields (left-justified) should be punched with blanks in any columns remaining in the field to the right of the punched data.

24. Rule: After the keypunching and after the final editing phases, obtain a listing of the raw data for documentation and reference purposes.

Rationale: There are many times during the data editing and even the analysis phase of a project when it is necessary to refer back to the raw data. The cards could be used for this purpose, but a paper listing is easier to handle, and does not jeopardize the order or the condition of the cards.

Note: If the complete set of data is extremely large (so that a complete data listing would be cumbersome and require a large volume of paper), a listing of the first 100 records or every Nth record is still recommended (where N is selected so that 100 to 200 records are printed). When all the editing and modifications to the data are completed, a complete listing should then be obtained for documentation and reference purposes.

Guidelines for Documenting and Storing Data

25. Rule: Document, in writing, all phases of the coding, punching, formatting, and editing steps.

Rationale: It is easy to forget, even after three or four weeks, why a decision was made or what the decision was. It is a good idea to make notes through the entire data transcription process of why and what decisions were made. Particularly important is a careful, up-to-date set of documentation on the data format and coding assignments. If very extensive data editing is necessary, it is also important to document any editing rules and any changes made to the original punched data.

26. Rule: After any important (costly) change in the data, immediately make a duplicate copy of all the data for storage separately from the working copy of the data.

Rationale: If the data are stored on cards, problems can occur such as the cards being dropped, torn by the card reader, sorter, etc., or simply lost. If the data are stored on tape or disk file, the tape can be misplaced, and both tape and disk files can be inadvertently scratched (erased). Thus, it is important, no matter what storage form is used to keep a duplicate copy of the data. This rule applies primarily to three key points in the data transcription process: (a) after the data have been received from the keypunching area; (b) after any costly computer run creating new or modified data; and (c) after the data have been edited and finalized.

Note: For long-term storage of important tapes, one copy of the data should be stored in a location such that a fire or other damage in one area would not destroy the second copy of the data. For short-term storage, cards should be stored packed tightly together in an upright position (without rubber bands), preferably in a file made for storing cards. Cards should be read to tape for long-term storage.

27. Rule: When storing tapes or cards, write all identifying information on the tape label or cards and, if possible, store identifying information with the data.

Rationale: After a short period of time, unlabelled tapes or cards are difficult to identify; it makes good sense to write on the cards (across the top of the deck or on the first card) or attach a label to the tape specifying all identifying information. A copy of the data format can also be folded and stored next to the cards or inside the tape cover. The identifying information should include: (a) creation date, (b) description of data, (c) sequential run or data set number, and (d) all information required for using the tape or cards.

Note: When storing cards, it is a good idea to put a diagonal line across the top of all the cards (with a felt-tip pen) and to write "F/C" and "L/C" on the first and last cards, respectively.

Summary

Preparing a good data file from raw input data is an important and often neglected phase of any effort involving data collection. By following the guidelines given in this paper, it is hoped that some of the problems that occur in preparing a data file can be avoided. It is obvious from the rationale for many of the rules given here, that creating a good set of computerized data is, to a large extent, a matter of applying common sense: thinking through how the data will be used, who will use the data, and what form of the data will be required for current and future analyses: in short, preparing for multiple contingencies.

For quick reference, the rules have been listed again below in abbreviated form:

1. Do not assign a code of zero to responses, particularly categorical responses.
2. Assign numeric codes to categories; do not use alphabetic codes to indicate responses to variables.
3. Missing data values should be coded as blanks.
4. Don't punch or code decimal points (or other punctuation such as "$", commas, etc.).
5. Don't change uncategorized data into categories, combine one or more responses as one code, or collapse categories of responses into smaller number of categories at the time of coding or punching.
6. Use identical codes for all items in a questionnaire with the same responses.
7. Numeric codes for categorical responses should correspond to implicit ordering of the responses.

8. Code values assigned to response categories should be consecutive integers ranging from "1" to K, where K is the number of categories.

9. Where possible, assign standard codes to questionnaire responses.

10. Always assign a numeric identification (ID) number and sequence number to every card in the data set so that each card has a unique number identifying its sequence.

11. The ID number should be the first set of data on each card, followed by card or sequence numbers (within ID numbers), followed by frequently used respondent information, with data responses appearing last on the card(s).

12. The data format or lay-out should be organized in the same order as the questionnaire responses except where a conflict exists with rule 11.

13. A data field, such as card sequence number or ID number, which appears on every card per respondent should be located in the same columns on each card.

14. In general, card columns should be filled, starting with column one, without spaces (blank columns) between the variables.

15. Never assign more than one response to each column or position in the data format.

16. When sending cards to be keypunched or keytaped, request that the cards be verified.

17. When giving the data to the coder or keypuncher, include very specific and precise instructions about the format and the coding scheme. Instruct the coder or keypuncher to call or ask about any questions he/she has and to set aside those documents about which there are unanswered questions.

18. Before setting up a data format and deciding on coding schemes, examine the responses to a few of the returned questionnaires.

19. Before finalizing the plans for the format and code values for the data, discuss both with someone who is familiar with the kind of analysis programs that are or may be required.

20. Always make some kind of data editing check as the first step after the punched cards or keytape have been returned.

21. Edit the entire data field for a variable; do not edit each column separately within the data field.

22. As a general rule, numbers should be punched right-justified and alphabetic characters punched left-justified.

23. As a general rule, request that the keypuncher precede numeric fields with zeroes (zero-fill) when the number to be punched does not fill up the entire space.

24. After the keypunching and after the final editing phases, obtain a listing of the raw data for documentation and reference purposes.

25. Document, in writing, all phases of the coding, punching, formatting, and editing steps.

26. After any important (costly) change in the data, immediately make a duplicate copy of all the data for storage separately from the working copy of the data.

27. When storing tapes or cards, write all identifying information on the tape label or cards and, if possible, store identifying information with the data.

GLOSSARY

Alphabetic Codes - Codes that contain any letters from the alphabet or punctuation (except the decimal point or plus or minus signs).

Alphanumeric Codes - Codes that contain alphabetic characters, numeric characters, and/or punctuation.

Blank - Code used to indicate missing data; a blank card column is one that contains no punch.

Card - A data storage medium; each card contains 80 columns.

Card Number - Code used when there is more than one card per respondent to indicate the sequence of cards within ID numbers.

Categorical Variable - A variable which has discrete responses; i.e., the response can be placed in one of several categories; e.g., curriculum is a categorical variable which might have two responses: academic and nonacademic.

Character - One numeric digit, alphabetic character, or punctuation mark.

Code - The numeric (or occasionally alphabetic) representation of responses; e.g., the codes for male and female might be designated as "1" and "2", respectively.

Coder - The person who examines documents, assigning codes to responses where necessary, before documents are keypunched.

Column - One of 80 positions on a card. Also means one position on the data format for cards, tape, or disk.

Continuous Variable - A variable which can take on any value within a specified range; e.g. annual salary is a continuous variable that can take on values from zero to infinity (theoretically).

Data Field - See field.

Data Set - See file.

Disk - A data storage medium, similar to tape in terms of usage.

Editing - The process of checking coded data on cards, tape, or disk against the raw data (e.g., questionnaire) to correct errors that occurred during transcription.

Execution of a Program - The actual running of a program through the computer.

Field - The columns allocated on the data format to one variable; e.g., the ID number might occupy four columns: these four columns are referred to as the ID field.

File - Any set of computerized data that logically belongs together; e.g., all the punched cards from a questionnaire administration might be called a file.

Format - A written description of all variables in a data record, their location (column positions) and codes for categorical variables or ranges for continuous variables.

ID Number - The unique identifying number for every respondent for which there is a card or data record.

Item - One question on a survey or questionnaire.

Job - A computer run. See execution of a program.

Keypunch - The machine that punches cards for computer input or the process of punching data onto cards.

Keytape - A keypunch-like machine that produces computerized data on tapes instead of cards.

Leading Zeroes - Zeroes punched in the left-most columns of a numeric field when the datum to be punched does not fill the entire field; e.g., ID number one punched as "0001" has three leading zeroes.

Lay-out - See format.

Left-justify - Punched data beginning in the left-most column of the field; e.g., the name "JONES" in an eight column field, left-justified, is punched "JONESbbb," where "b" means a blank column. Left-justification is used for alphanumeric data.

Listing - A computer-produced paper copy of the data.

Missing data - Responses left blank by the questionnaire respondent, or data which are unobtainable.

Numeric Codes - Codes which contain only numbers (the digits zero to nine) with or without a decimal point or a sign (plus or minus).

Output - The results obtained from the running of a program.

Package Program - Any of a number of previously written computer programs available to perform data analysis and manipulation.

Print-out - Output on paper.

Punch - The square holes on a computer card designating numeric and alphabetic codes in each column of the card.

Record - The set of data fields connected physically (all fields on one card) or logically (all fields for one respondent).

Response - The answer given to an item or the information recorded for a particular variable; e.g., a questionnaire item that asks, "What is your sex?" has two possible responses: male and female.

Sequence number - See card number.

Subscript - A number associated with a categorical variable that designates response codes; e.g., the variable 'sex of respondent' might have responses designated S_1 and S_2 to indicate male and female.

Tape - A data storage medium for the computer.

Transgeneration - The process of converting one type of code to another; e.g., (a) the continuous variable salary, might be transgenerated so that there are three salary categories: high, medium, and low; (b) a variable coded as "1", "2", "3" might be transgenerated so that the codes are "3", "1", and "2", respectively.

Verification - The process of checking punched cards (or tape) for accuracy. Sight verification is done by hand and machine verification is done by the keypuncher with a special verifying keypunch.

Zero-fill - An instruction to the coder or keypuncher that leading or trailing zeroes are to be punched or coded in numeric fields.